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THE JOURNAL

OF THE

American Medical Association

JUNE 26, 1954

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THE JOURNAL

of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 155, NO. 9 — CHICAGO, ILLINOIS — JUNE 26, 1954

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MEDICINE AND THE PUBLIC WELFARE

PRESIDENT'S ADDRESS

Walter B. Martin, M.D., Norfolk, Va.

I have taken this solemn oath tonight with a full realization of the responsibility that has been placed upon me. It is not a responsibility that I lightly assume. I enter upon the duties of this office with a deep sense of need for a higher power than mine to guide my feet and to strengthen me in body, in mind, and in spirit. It is my desire and purpose during the coming year, through the instrumentality of this great association, to aid in some measure in the realization of our objectives, "to promote the art and science of medicine and the betterment of the public health."

These are no common times in which we live. There is no peace and no repose. Those who have activated the evil forces loose in the world today have said in their hearts, "There is no God." Having abandoned the moral code, they threaten us from abroad and by stealth and deception are attempting to undermine from within the very foundations of the Republic. Our people are disturbed. Distrust is abroad in the land, and our confidence in each other has been shaken. This is a time when petty issues should be put aside, small quarrels forgotten, and when we should join together and rededicate ourselves to those principles and practices that have been the foundation of our freedom.

This country was built around our places of worship, our schoolhouses, and our courts of law. It will remain strong and secure as long as we adhere to the moral code, continue to expand in the field of knowledge, and continue to uphold the hand of justice. On our own profession rests a peculiar responsibility. Our members are close to the people, perhaps closer than any other group. Ours is a tradition of service, devoted to the healing of the minds and bodies of men. We hold in trust for oncoming generations the knowledge and ideals handed down to us from the past.

When this association was organized in 1847, the preamble to its constitution stated its purpose to be "to cultivate and advance medical knowledge, to elevate the standards of medical education, to promote the usefulness, honor and interest of the medical profession, and to enlighten and direct public opinion in regard to the duties, responsibilities, and requirements of medical men." For more than 100 years we have held to these principles. We have been conscious of our great blessing in living in a free society, where the processes of education have continued uncorrupted by propaganda, where the final authority has been the authority of truth, of justice, and of the moral law. We are conscious of our obligation and duty to this society, to uphold it and strengthen it and to serve it in our capacity as physicians. It is our duty to serve it not only as individual physicians but as citizens concerned with the public welfare. It is our duty as organizations, local, state, and national to serve it by constantly striving to advance the art and science of medicine, and to apply our knowledge to the further betterment of the health of the public.

ADVANCES IN MEDICINE

Medicine has bloomed under the beneficent warmth of freedom. It has bloomed and borne fruit as witnessed by the great advances in the last 50 years in the science of medicine and its application to the prevention and control of disease. During the past half century, 20 years have been added to the span of human life in this country. The acute infections that scourged the younger age groups have to a great extent been brought under control. Childbearing has been freed of most of its dangers and suffering, until now death from childbirth is less than one in a thousand. The improvement in infant mortality proportionately has been almost as great. Now the emphasis of medicine is shifting. More and more we are concerned with the chronic and degenerative diseases of an aging population. The genius of medicine as expressed through research, teaching, prevention, and treatment has prolonged life to such an extent as to create these problems in their present magnitude. This same genius if left unhampered to operate in a free society can also solve these new problems.

CHANGING ENVIRONMENT OF MEDICINE

These great gains have been a reflection of the favorable environment under which medicine has lived for the past 50 years. This environment is changing, however. Political, social, and economic factors are at work and

Read before the 103rd Annual Meeting of the American Medical Association, San Francisco, June 22, 1954.

have altered the conditions under which medicine is practiced. Some of these changes are beneficial; some may be harmful in their ultimate effect. It is necessary that we be aware of them and that we study them not only as to their apparent immediate benefit but also as to their possible ultimate effect on the quality as well as the quantity of medical care and other health services that will be available to our people. The basic factors in good medicine are immutable. Medical research and medical teaching must remain free from ideological or political controls. The mind that seeks for the truth must not be shackled. The practice of medicine must not be brought under government or corporate control. The individual's sense of responsibility for his own health and that of his family must not be dulled or destroyed. The physician's sense of personal and moral responsibility to his patient as an individual must be preserved.

Advances in the science of medicine in all its branches have been accompanied by a corresponding expansion of hospitals and other facilities so necessary in the practice of medicine today. The machinery of medicine has become massive, intricate, and expensive, and it requires a constantly growing number of highly trained technicians to service it. The duties of the registered nurse have become more specialized, and many demands other than the direct nursing of the patient are now made on this great profession. A shortage of registered nurses exists, and the practical nurse is moving into the vacuum. Medical schools have expanded their functions, particularly in the area of postgraduate education, and have constantly raised their standards in order to produce physicians trained to meet the demands of modern medicine. The training period for a physician is longer and more costly to both the individual and the school. The cost of producing good medical care and making it available to the people has increased. This has been reflected in a corresponding increase of the per diem cost of medical care to the person that receives it. These economic factors have led to the development of various plans for easing the impact of this load on the patient and of establishing a firmer financial base for the hospitals. The rapid growth of voluntary prepayment insurance plans against the expense of health care has been impressive and is continuing. Sufficient progress has not yet been made in providing an orderly and generally acceptable way of meeting the needs of those who are not able to care for themselves by direct payments or under an insurance program.

With all these changes and material gains, the load upon our profession has increased rather than diminished. The volume of medical services available to the people has expanded enormously but not fast enough to meet the demand. The machinery of medicine is constantly being augmented. Never before have the triumphs and possibilities of medicine been so well publicized. Through press, radio, and by visual display, the marvels of modern medicine are brought to every receptive eye and ear, but still the people are not happy. They are disturbed in their minds and in their hearts. On the one hand, they have a nostalgic memory of an older and more personal system of practice; on the other, they fear that they may not have access to some miracle of medicine that is available to others. The mechanics of medicine have become the important part of medicine in the public eye. More hospitals, more equipment, and more technicians have become the symbol of medical progress. In this mechanical maelstrom many patients find themselves lost. They speed from this laboratory to that, from one specialist to another, with hardly a pause for consideration by anyone of their problems as a human being. It would be desirable if every patient could first seek the advice of a general practitioner of medicine. The general practitioner should determine the need for and kind of special studies suitable in each case.

The very success of medicine in a material way may now threaten the soul of medicine. Medicine is something more than the cold mechanical application of science to human disease. Medicine is a healing art. It must deal with individuals, their fears, their hopes, and their sorrows. It must reach back further than a disease that the patient may have to those physical and emotional environmental factors that condition the individual for the reception of a disease. The trend in modern medicine is to separate the patient further and further from the physician as a counsellor. Perhaps much of this is our fault. Perhaps we have failed in valuing the substance of medicine above its spirit. Perhaps we are bemused with medicine as a science and have neglected the art of our profession.

The medical profession has a particular responsibility in reference to self-discipline. As a learned profession, we are permitted to judge ourselves and each other. It is difficult for others to judge us, since it is only our brother physicians who can determine our competency and often our motives. This responsibilty is not only on each of us as individuals but is also a concern of our organized groups, hospital staffs, and local and state societies and the American Medical Association. It is the duty of organized medicine in public matters that affect or may affect the medical welfare of the people to speak plainly. It is their duty to study the medical problems of the body politic and to inform themselves concerning them and to give advice without fear and without consideration of self-interest. We must not be swayed by special groups or special interests but only by consideration of the overall good of medicine and the medical welfare of the people. We should, to paraphrase Hippocrates, in public affairs, "follow a system of regimen which, according to our ability and judgment, will be for the benefit of our patient," the public. We must follow a policy that, in our judgment, will develop and maintain an environment in which good medicine will thrive and that will promote the extension of a high quality of medical service to all.

PROBLEMS TO BE MET

Medicine has come far in our lifetime but not yet far enough. Now is no time for complacency. Medicine is not static. It either will go forward or will retreat. We have many problems to solve in medicine today. They cannot be settled by governmental fiat or by an easy formula or blueprint. Their solution lies in the hands of thousands of workers in the field of health, research, teaching, and public health and in the practice of medicine. It lies in the hands of all physicians as individuals and as groups in their own communities and areas and in the nation.

Voluntary prepayment plans should be further extended to include a larger fraction of the insurable population. At the present time about 72% of the insurable population carries some form of insurance against the cost of hospital care. They should expand not only numerically but also in an extent of coverage compatible with sound insurance principles.

The expansion of a well-balanced hospital system should continue with due regard for the increasing need of beds for convalescent and chronic cases. A radical shift should not be attempted, but changes should proceed slowly on the basis of careful surveys and plans by state groups to determine their particular needs. The states and localities should assume their full responsibilities for financing the care of the low-income and uninsurable groups in order that all may have access to good medical care. Shortages of health personnel exist, particularly in certain areas. Successful efforts in a number of states have improved the distribution of physicians. The number of physicians being graduated each year is increasing more rapidly than the growth of population. This is encouraging. We should continue to give thought to the conservation of our health personnel by avoiding further expansion of federal medical services at the expense of our voluntary system that is designed to serve all of our people.

Medical support of the armed forces should be maintained at a high level of effectiveness. As individuals, each of us should be eager to contribute our services when needed. As an organization, we should support sound measures that will strengthen the medical services of the armed forces and that are not wasteful of our total medical resources.

Medical schools are in need of financial assistance. We are satisfied that federal aid to medical schools to meet operational costs introduces an element of danger to the freedom of medical education that outweighs the need, however pressing that may be. It is a particular responsibility of the physician in this country to aid in the financing of medical education. Few of us paid the full cost of our medical training at the time we received it. The debt is long past due, and each of us should make payments on this debt.

We should above all look to our own house and see that it is in order. As practitioners of medicine, we have dedicated ourselves to the service of humanity. We should remember this at all times and, in our private and public acts, hold that thought as a torch before us. The forces that threaten the free world and that are attempting to undermine our institutions cannot be turned back by the power of armed might alone. Before they can destroy us, they must corrupt us and weaken our moral fiber. We as physicians have an important part to play at this time of doubt and fear by maintaining and extending the health resources of our country. The problems that confront us we can solve if we have good will and if we rededicate ourselves to the high ideals of medicine. It is necessary that we solve them within the framework of our democracy so that our nation and its people may be strengthened and can meet with a united and resolute force the dangers that threaten us.

229 W. Bute St. (10).

EVALUATION OF SURGICAL INTERVENTION IN GASTRIC ULCERS

Donovan C. Browne, M.D., Robert E. Mitchell Jr., M.D., Gordon McHardy, M.D.
and
George E. Welch, M.D., New Orleans

The controversial opinions prevalent today regarding management of peptic ulcers are understandable, in view of the fact that no single specific causative factor can be established. Probably the most difficult problem confronting the gastroenterologist is selection of the surgical case of gastric ulcer. This has become increasingly important with the growing advocacy by some that all patients with gastric ulcers should be operated on because (1) malignant lesion is present or will develop in 8 to 10%, (2) ". . . morbidity due to benign ulcers is terminated promptly, the results of surgical treatment are excellent, . . ." [1] and (3) the operative fatality rate is low.

The problem would indeed be simplified if the foregoing statement could be unreservedly accepted, but excellent studies that have accumulated through the years seriously question the advisability of following a surgical course categorically. The follow-up studies of Smith, Boles, and Jordan,[2] Cain,[1] Brown,[3] and a number of others indicate that equally satisfactory or better results are obtainable from medical treatment of the uncomplicated gastric ulcer and reveal an operative fatality rate of 2 to 5%. Major physiological disturbances, such as the "dumping" syndrome, occur in 8 to 10% of patients after resection. Nutritional deficiencies, anemia, and minor distress comprise another 10%, and marginal ulcers develop in a low 1 to 2%. It can hardly be accepted, therefore, that surgical management of gastric ulcers, in its present state, provides the answer to the gastric ulcer problem. It is true that mortality is low in institutions with adequate facilities and with properly trained surgeons, but, unfortunately, all operations are not performed under these optimal conditions.

The pressing problem for the clinician, then, is to determine whether the gastric ulcer is malignant at the time of examination. The present survey was motivated

From the Department of Gastroenterology, Browne-McHardy Clinic, Department of Medicine of Tulane University School of Medicine, Charity Hospital, and Touro Infirmary.

Read at the Seventh Clinical Meeting of the American Medical Association, St. Louis, Dec. 3, 1953.

1. Cain, J. C.; Jordan, G. L., Jr.; Comfort, M. W., and Gray, H. K.: Medically Treated Small Gastric Ulcer: Five Year Follow-Up Study of 414 Patients, J. A. M. A. **150**: 781-784 (Oct. 25) 1952.

2. Smith, F. H.; Boles, R. S., Jr., and Jordan, S. M.: Problem of Gastric Ulcer Reviewed, J. A. M. A. **153**: 1505-1508 (Dec. 26) 1953.

3. Brown, C. H.: Benign Ulcer and Carcinoma of Stomach, J. Am. Geriatrics Soc. **1**: 177-189 (March) 1953.

by this primary problem. Two groups of patients have been studied. Group 1 included 247 consecutive patients in whom a diagnosis of neoplasm of the stomach or gastric ulcer was made and who received routine therapy without benefit of any specific plan of study. Group 2 consisted of 200 patients in whom a diagnosis of gastric ulcer or suspected malignant lesion was made according to an accepted rigid plan of evaluation.

RESULTS OF STUDY

Group 1.—Of the 247 patients in group 1, 130 (52.7%) had an unequivocal diagnosis of malignant gastric lesion, with no question of gastric ulcer arising clinically or histologically. In the remaining 117 (47.3%), a diagnosis of gastric ulcer was made with or without reference to malignant lesion. Among these 117 were 93 men and 24 women, a distribution by sex that conforms to the accepted ratio of 4 to 1. Inspection of the incidence by age revealed the greatest frequency in the third, fourth, and fifth decades of life.

Of these 117 patients with a diagnosis of gastric ulcer, there were 71 (28.9%) with uncomplicated benign gastric ulcer, 29 (11.7%) with suspected malignant lesion

TABLE 1.—*Preoperative Diagnosis in Twenty-Nine Patients of Group 1 with Suspected Malignant Lesion and Other Complications*

Preoperative Diagnosis	Pathological Diagnosis: Malignant	Benign	Total
Possible malignant lesion	11	12	23
Perforation	1	0	1
Obstruction	3	0	3
Duodenal ulcer, healed gastric ulcer *	1	0	1
Antral irregularity *	1	0	1
Total	17 (58.6%)	12 (41.4%)	29

* By roentgenographic examination.

or other complication (10 had perforations and 16 active bleeding), 5 (2%) with gastric ulcer of specific cause, and 12 (4.9%) with only "possible gastric ulcer." The diagnosis of benign gastric ulcer was made roentgenographically in 62 (87.3%) of the 71 cases, roentgenographic examination was not attempted in 5 (7.1%) patients with perforations and bleeding, and in the other 4 (5.6%) it was reported negative or unsuccessful because of perforation, bleeding, or inability of the patient to cooperate. Gastroscopic examination, performed in only 8 of 71 patients, revealed 7 patients with benign ulcer and one with a normal stomach. Forty-six of these 71 patients were operated on, 36 (50.7%) of whom had subtotal gastric resection and the remaining 10 (14.1%) other procedures, such as biopsy, simple closure, and block resection. The other 25 (35.2%) patients refused surgical intervention. No evidence of malignant lesion was found on pathological examination in any of the patients operated on; 43 had benign gastric ulcer, 2 were normal, and one had leiomyoma. In six cases there was associated gastritis.

All 29 of the patients with suspected malignant lesion and other complications were treated surgically. Only 11 of the 23 cases of suspected malignant lesion were confirmed on pathological examination. The remaining six patients, suspected of having other complications as well, all proved to have malignant disease; one of these had perforation, three had obstructive lesions at the pylorus, one had roentgenographic evidence of duodenal ulcer with irregularity of the lesser curvature suggestive of a healed gastric ulcer, and the last had roentgenographic evidence suggestive of antral irregularity. Thus, 17 (14.4%) of the 117 patients with a preoperative diagnosis of gastric ulcer and other complications had malignant lesions, and 12 (41.4%) of the 29 patients with suspected malignant lesion and other complications who were operated on proved to have benign ulcers (table 1).

In 5 cases among the 117 a specific causative agent was indicated for the diagnosis of gastric ulcer. Total gastrectomy was performed in one such patient with a phytobezoar, but histological studies of specimens proved the extensive lesion, including the lymph nodes, to be an inflammatory process. In one case a diagnosis of polyp, with ulceration, in the lower fundus was made roentgenographically and was reported at gastroscopy as a sessile polyp on the anterior wall of the fundus. Surgical intervention was advised in this case, but the patient refused. Another patient with previous gastric resection had a marginal ulcer but also refused operation and was therefore treated medically. In the fifth patient a roentgenographic diagnosis was made of prepyloric ulceration involving the greater curvature, which, on operation and pathological examination, proved to be redundant benign gastric mucosa prolapsing through the pylorus.

Review of the 12 cases of possible gastric ulcer revealed possibly the greatest weakness in the study and management of all the patients in group 1. These patients constituted an equivocal group with regard to diagnosis but did not have benefit of careful comprehensive diagnostic study, which will clarify the diagnosis in most instances and which we consider essential. Because this group constituted such a source of confusion and controversy, a second series of patients was studied, for whom a rigid plan of examination and management was established.

Group 2.—In this group of 200 cases, a definite program, incorporating the essentials of a thorough study, was established for examination and management. Only those cases that satisfied all the requirements of this program were accepted for inclusion in this study. The following diagnostic and therapeutic procedure was used: (1) history; (2) physical examination; (3) gastric analysis (histamine, if indicated); (4) examination of feces for infection and for occult blood by the guaiac test; (5) other laboratory studies, as indicated (Subsequently, cytological studies with the Ayre brush technique were included in this examination program.); (6) roentgenographic examination, including gastrointestinal series, barium enema, and gallbladder visualization, when practical; (7) gastroscopy, when indicated and possible; and (8) diagnosis, (*a*) if malignant or equivocal, immediate surgical intervention and (*b*) if benign, medical management for two to four weeks, followed by reevaluation. This program was not varied except when emergencies existed.

A diagnosis of uncomplicated benign gastric ulcer was established in 164 of the 200 patients; all these were treated medically and, therefore, are not primarily related to the present problem. The remaining 36 underwent

subtotal gastric resection (table 2). Bleeding in six patients, a degree of obstruction in three, and evidence of perforation in four were the primary factors favoring surgical intervention. Specific deliberation was required only in the other 23 patients, because response to medical therapy was unsatisfactory, healing was not prompt, symptoms were not relieved, or malignant lesion was suspected.

Histological studies of surgical specimens in these 36 patients operated on revealed benign ulcer in 27, carcinoma in 2, hypertrophic gastritis with erosion but no typical peptic ulcer in 3, duodenal ulcer associated with severe antral gastritis in 2, and duodenal ulcer with pyloric ulcer and Meckel's diverticulum in one (table 3). Thus, 75% of the surgical patients with suspected malignant lesions or poor response to medical therapy had benign ulcers, and only 5.55% had malignant lesions. Other diseases and complications accounted for the remaining 19.45% of the operative cases (table 3).

TABLE 2.—*Surgical Indications in Thirty-Six Patients Operated on in Group 2**

Surgical Indication	No.	% of 36 Patients	% of Total 200 Patients
Failure to respond to medical management; malignant lesion suspected	23	63.7	11.5
Bleeding	6	16.6	3
Obstruction	3	13.8	2.5
Perforation	4	11	2
Total	36	100	18

* All subtotal gastric resections.

TABLE 3.—*Pathological Diagnosis in Thirty-Six Patients Operated on in Group 2*

Pathological Diagnosis	No.	%
Benign gastric ulcer	27	75
Hypertrophic gastritis with erosion but no ulcer	3	8.3
Duodenal ulcer; antral gastritis	2	5.55
Duodenal ulcer; gastritis; Meckel's diverticulum	1	2.8
Leiomyoma	1	2.8
Carcinoma	2	5.55
Total	36	100

It has frequently been stated that serial sections will demonstrate a higher percentage of malignant lesions. Recent studies by Brown,[4] however, do not support such an opinion. Multiple sectioning in this group was done purely at the discretion of the pathologist.

Roentgenographic diagnosis proved accurate in 86.5% of the 200 cases. On the basis of ultimate pathological findings, the error of 13.5% constituted a safeguard against the possibility of excluding malignant lesion in equivocal cases (table 4).

Gastroscopic examination, permitted by 19 of the 36 patients operated on, did not prove as reliable a diagnostic procedure as roentgenographic studies. In five patients lesions, located principally in the prepyloric area, were discernible roentgenographically but were not visible on gastroscopy. In one instance an ulcer seen with the gastroscope was not reported roentgenographically. In 11 (57.9%) of the 19 instances, gastroscopic findings concurred with the histological report, in 3 (15.8%) they disagreed, and in 5 (26.3%) no lesion was demonstrable on gastroscopy (table 4). In experienced hands, gastroscopy, when positive, is a valuable adjunct in the diagnosis of gastric ulcers and should be employed, whenever practical, to establish the diagnosis and evaluate the healing process. Its maximal value, however, must await sufficient improvement in the instrument to permit consistent biopsy and, under direct visualization, extraction of material for cytological study.

Results of gastric analyses in these cases did not conform completely to the pattern established by some earlier workers, and the important consideration in the

TABLE 4.—*Accuracy of Roentgenographic and Gastroscopic Findings in Group 2*

Result	Roentgenographic Findings		Gastroscopic Findings	
	No.	%	No.	%
Correct	173	86.5	11	57.9
Incorrect	27	13.5	3	15.8
Lesion not visible	...	....	5	26.3
Total	200	100	19	100

present series was the relationship of achlorhydria to the development of malignant lesions. Thirty-two of the 36 patients operated on had free hydrochloric acid (table 5). Repeated analyses in several of these were inconsistent, but lack of relatively standard conditions in these cases seemed to emphasize the importance of this for uniform results. The four cases of proved histamine achlorhydria occurred in two patients with carcinoma, one with leiomyoma and one with benign ulcer. This limited number of cases, however, does not justify any definite conclusions concerning this procedure.

On admission of each patient, feces were examined for occult blood by the guaiac test; results were positive in 30 of the 36 operative cases (table 5). Although this procedure is admittedly not diagnostic, none of the patients having been on a hemogloblin-free diet, it did serve in some degree as a criterion for subsequent management, since under a rigid ulcer regimen the occult blood test becomes negative as the ulcer becomes quiescent. The final pathological diagnoses for six patients with negative guaiac tests on admission included one of gastric leiomyoma, one of gastritis and duodenal ulcer, one of gastric diverticulum, and three of benign gastric ulcer.

TABLE 5.—*Results of Gastric Analysis and Guaiac Tests in Thirty-Six Operative Cases of Group 2*

Result	Gastric Analysis		Guaiac Test	
	No.	%	No.	%
Positive	32	88.9	30	83.3
Negative	4	11.1	6	16.7
Total	36	100	36	100

Thus, in the 200 patients with gastric ulcer in group 2 who were studied according to a rigid plan, immediate diagnoses included benign gastric ulcer, suggestive malignant lesion, or some other complication. One hundred sixty-four (82%) had an ultimate diagnosis of uncomplicated benign gastric ulcer and were treated medically; these were placed in the group for follow-up evaluation. Of the 36 (18%) treated surgically (table 2), only 2 (5.55%) had malignant lesions proved on pathological

4. Brown, C. H.; Fisher, E. R., and Hazard, J. B.: Relation Between Benign Ulcer and Carcinoma of Stomach: Report of 8 Cases of Malignant Transformation, Gastroenterology **22**: 103-111 (Sept.) 1952.

study, 27 (75%) had proved benign gastric ulcers, and the other 7 (19.45%) had other nonmalignant lesions (table 3).

COMMENT

The 447 patients included in this survey were divided into two groups. In the first group of 247 patients, diagnosis and management were not rigidly controlled, and all patients were offered operation as preferable therapy. In the second group of 200 patients, a definite program was followed with the specific purpose of carefully differentiating those who required surgical intervention for possible malignant lesion or other recognized surgical indication from those with benign uncomplicated gastric ulcers amenable to medical management. This survey indicates that in instances in which careful examination and evaluation are practical, the possibility of including malignant lesions in medically managed cases may well be reduced to an extremely small percentage, i. e., 1% (2 out of 200 cases) in this more rigidly controlled group, as compared to 14.4% (17 of 117) of routine hospital admissions with suspected pathological condition. Errors that occurred were well on the conservative side, 41.4% of the 29 patients with suspected malignant lesion in group 1 (table 1) and 94.45% of the 36 patients in group 2 operated on (table 3), having histologically proved benign ulcers.

Unfortunately, when the clinician does not adhere to the program of careful and thorough examination of all patients with gastric ulcers, either because he is too busy or because the patient is often resistant, the accepted 10% or more of patients with malignant lesion may be encountered at operation. Approximately 20% of patients with gastric ulcer will require operation for one or more of the accepted complications. It might be rightfully questioned whether some of those patients selected for medical management might not have malignant disease, and, of course, there is no reliable method available today for determining this, except on the basis of statistical implications. No case of malignant lesion was found among the patients in group 1 operated on whose ulcers were definitely diagnosed preoperatively as benign by all criteria. That the benign ulcer may subsequently become malignant is a possibility, not a probability; its future depends on adequate management. A healed gastric ulcer is unlikely to recur five years later as a malignant lesion without any intervening difficulty.[5] The stomach that is susceptible to peptic ulceration may also be susceptible to malignant disease. Why should all gastric ulcers not be treated surgically? Physiological invalidism consequent to gastric resection of benign ulcers often creates a problem in management greater than the primary lesion for which the operation is performed.[5]

The value of cytological study of the gastric cells has already been established and offers great potentialities as an aid in the diagnosis of gastric disorders. In the past few months we have added this procedure to our evaluations, employing the Ayre brush technique.

SUMMARY AND CONCLUSIONS

The primary problem of the clinician, when confronted with gastric ulcer, is establishment of the diagnosis at the initial examination. Diagnostic accuracy is significantly increased by more comprehensive study. Each case of gastric ulcer should be individualized, and operation should be advised only when specific indications for it exist, including the accepted complications and unfavorable response to medical management, as indicated in this study. Uncomplicated benign peptic ulcers should not be treated surgically. Fear of malignant lesion should not be used to establish a dictum of surgical intervention for all gastric ulcers.

3636 St. Charles Ave. (Dr. Browne).

5. Palmer, W. L., and Humphreys, E. M.: Gastric Carcinoma: Observations on Peptic Ulceration and Healing, Gastroenterology 3: 257-272 (Oct.) 1944. Brown and others.[4]

FURTHER OBSERVATIONS ON THE ARMCHAIR TREATMENT OF ACUTE MYOCARDIAL INFARCTION

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Experience with the armchair treatment of 81 patients with acute coronary thrombosis and myocardial infarction has been recently reported.[1] These patients received customary management except that they were allowed to sit in a chair for varying and increasing portions of the day. The chair treatment was usually instituted within 24 to 48 hours and in all instances within a week after the onset of the attack. The immediate results were favorable. The patients experienced a continued sense of well-being and high morale; the occurrence of pulmonary edema and congestion was prevented; there was a negligible incidence of other complications; and there was no increase and possibly a decrease in mortality.

Complete endorsement of this method of therapy, however, is contingent on its effect on the eventual course and prognosis. The purpose of the present study is to evaluate long-range results. The objection has been raised that keeping patients sedentary in a chair during the acute phase of myocardial infarction may increase the possibility of localized weakening of infarcted tissue. Special attention was therefore given to the frequency of development of ventricular aneurysms. Since the transition from bed to chair may strain the myocardium and may predispose to ultimate complications, additional observations were made on pulse, respiration, and blood

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Dr. Mitchell was a research fellow in medicine of the American College of Physicians, 1952-1953.

1. Levine, S. A., and Lown, B.: "Armchair" Treatment of Acute Coronary Thrombosis, J. A. M. A. 148: 1365 (April 19) 1952.

pressure responses immediately following the assumption of the upright position in patients with acute coronary thrombosis.

FOLLOW-UP RESULTS

Of the original 81 armchair-treated patients, 8 died during the acute attack within 4 to 18 days. The average age of these patients was 73 years. Four of the eight had clinical and pathological evidence of old as well as recent infarction. Two patients whose death was ascribed at postmortem examination to multiple pulmonary emboli received no anticoagulants because of a history of peptic ulcer. In the two other cases, death was considered on clinical grounds to be due to arrhythmias.

Of the 73 who recovered from the acute episode, 17 subsequently died (table 1). Eight died within 12 months (average 4½ months), and nine died during the second 12 months (average 16½ months). Thirteen of these 17 patients experienced angina pectoris. Eleven had angina prior to the chair-treated infarction. Fourteen patients showed before their death evidence of congestive heart failure. In 10 the failure was associated with angina pectoris. In the majority the inception of failure occurred shortly after the acute illness. In 16 of the 17 patients death was due to cardiac factors attributed to either intractable congestive failure or recurrent episodes of coronary thrombosis.

Thus of the original 81 patients, 25 died within a two year period. We were able to reexamine 42 of the 56 living patients. The average length of time between the attack of coronary thrombosis and reexamination was 26 months, with a range of 15 to 38 months. Each patient was questioned about his cardiac status, given a complete physical check-up, carefully studied by fluoroscopy and roentgenograms of the heart, and given a 12-lead electrocardiogram.

Among the 42 patients reexamined, there were 18 who had definite angina pectoris before the attack of coronary thrombosis. In the follow-up study, 17 of these and 4 additional patients showed the anginal syndrome. Angina disappeared in one patient after the acute illness. In three others angina developed for the first time one to two years after the coronary episode. One patient who experienced angina after the acute attack noted its disappearance two and one-half years later. There were six patients who had definite evidence of congestive failure. In only one case was it present before the attack. In four, congestive symptoms developed during or directly after the acute episode, and in one additional patient these symptoms first appeared two years later. This is in clear contrast to the group of patients who died in the follow-up period, 14 of 17 showing failure. Evidence of failure is obviously a grave prognostic sign.

Although most of the patients in this series experienced their first attack of coronary thrombosis, there were seven among those reexamined who had had one previous attack and two who had had two previous attacks. During the follow-up period, a new infarction developed in two. In other words, only 2 of these 42 had subsequent occlusions after the chair-treated illness, during an average follow-up period of 26 months. Among those who died, during this same period, a total of 10 experienced additional myocardial infarctions.

All of the 42 patients in this group were ambulatory and able to come to the hospital for examination. Eighteen were carrying on their customary full duty. Four were estimated to be doing 75%, and nine were performing 50% of their previous activities. Seven were either unable or unwilling to do any work, and the remaining four were retired before the initial attack and had not resumed work. The occupations of most of this group of 42 were sedentary.

DEVELOPMENT OF ANEURYSMS

Postmortem examination provides the most reliable evidence of the presence of a ventricular aneurysm. The pathological reports indicate that anywhere from 5% to 38% of all myocardial infarctions are followed by aneurysm formation in the injured ventricle. Yater reports an incidence of 20% of men over the age of 40.[2] Clinical diagnoses of ventricular aneurysm are based on the electrocardiogram and fluoroscopic or roentgenologic examination.

TABLE 1.—*Follow-Up Study of Seventy-Three Armchair-Treated Patients with Acute Myocardial Infarction**

	Patients Who Died	Living Patients Reexamined	Living Patients Not Reexamined
Average survival period	11 mo.	26 mo.	29 mo.
Range of survival	(2-24 mo.)	(15-38 mo.)	(25-38 mo.)
Angina pectoris			
Before chair-treated infarction	11	18	3
Initial attack just after infarction	1	4	3
Appeared 1-2 yr. after infarction	1	3	0
Disappeared after infarction	0	1	1
Congestive heart failure			
Before chair-treated infarction	4	1	0
Initial appearance just after infarction	9	4	0
Developed 1-2 yr. after infarction	1	1	0
Myocardial infarction (definite)			
One previous to chair-treated episode	1	7	1
Two previous to chair-treated episode	1	2	0
One subsequent to chair-treated episode	8 (7 fatal)	2	1
Two subsequent to chair-treated episode	2 (both fatal)	0	0

* Seventeen patients died after the acute episode. Forty-two of the living patients were reexamined. Of the 14 living patients who were not reexamined, we obtained reports from other physicians on 10 and obtained no information on the other 4.

A persistent elevation of ST segments in precordial leads after the evolvement of the electrocardiographic picture of myocardial infarction presumably provides suggestive evidence of ventricular aneurysm.[3] Among the 42 cases in this study, there were 5 patients with slight or suspicious elevation of the ST segment in the precordial leads, and 4 who showed more definite elevations of this type. It is not known whether these changes antedated the chair-treated episodes. In one patient who had electrocardiograms prior to the myocardial infarction similar ST segment elevations were present. If the persistent ST segment deviations observed in this series, even

2. Yater, W. M.; Welsh, P. P.; Stapleton, J. F., and Clark, M. L.: Comparison of Clinical and Pathologic Aspects of Coronary Artery Disease in Men of Various Age Groups: A Study of 950 Autopsied Cases from Armed Forces Institute of Pathology, Ann. Int. Med. 34: 352, 1951.

3. Ford, R. V., and Levine, H. D.: The Electrocardiographic Clue to Ventricular Aneurysm, Ann. Int. Med. 34: 998, 1951.

those of minimal degree, are to be ascribed to ventricular aneurysm, the incidence is 21%. This of course assumes that all the ST segment changes had their origin with the chair-treated infarction. An incidence of 21% is not materially different than that reported for conservatively treated patients.

More reliable evidence of ventricular aneurysm is obtained by roentgenologic and fluoroscopic examination. Forty-one of the 42 cases were studied fluoroscopically with this point particularly in mind, and in no case was a ventricular aneurysm found. No doubt small areas of thinning of the ventricular wall might well have been present in some of these cases and could have been overlooked on fluoroscopic examination. It is significant, however, that if the development of ventricular aneurysms were to be regarded as a direct result of the armchair method of treatment, one would have expected to find a few instances on careful fluoroscopic examination. The fact that none whatever was observed seems to be valid evidence that this method of care does not encourage the development of ventricular aneurysm. In fact it makes one suspect that the incidence of such a complication may have been decreased.

Certain other changes were noted in the roentgenologic study. Of the 42 patients who were reexamined, 24 had hypertension. Twelve of the patients with hypertension had enlarged hearts, and the hearts of the other 12 were within normal limits. There were five instances of cardiac enlargement without elevation of the blood pressure. Films of five patients were found to show moderate pulmonary congestion, 10 others showed slight congestion, and 27 were within normal limits. Fluoroscopically, some irregularity of contraction along the left cardiac border was noted in 18 patients, possibly caused by a healed scar in that area.

In summary, 42 of the 56 surviving patients of the original series of 81 chair-treated cases of acute myocardial infarction were reexamined at an average of 26 months after the chair-treated illness. Four had their initial attack of angina pectoris immediately after the acute episode, and in three angina pectoris developed later. Four had their first symptoms of cardiac decompensation just after the infarction, and in one the symptoms developed during the follow-up period. Two patients had subsequent infarction. There were nine instances of electrocardiographic evidence suggestive of ventricular aneurysm, but none was found on careful roentgenologic and fluoroscopic study. Thirty-one of the 42 were able to work half to full time after convalescence was completed.

In addition to the 42 patients here reported on, information was available on 10 of the other 14 living patients. Data obtained from private physicians indicates the following facts. The period from the attack to the reexamination varied from 25 months to 38 months, with an average of 29 months. Three of these 10 patients had angina pectoris prior to the chair-treated myocardial infarction. Angina disappeared in one patient after the chair-treated infarction but appeared for the first time in three others, one of whom noted its disappearance a year later. In none of them did congestive heart failure develop after the infarction, and one survived a second infarction a year later. Six of the 10 were carrying on their jobs full time, and one worked about 25% of the time. One of the group was retired before the chair-treated infarction, and two others had more recently been forced to give up work because of illnesses unrelated to the heart. Electrocardiograms were reported for nine patients, and one of these was said to have some persistent elevation of the ST segments suggestive of aneurysm. There were no deaths and no instances of congestive failure. In general, the progress of those 10 patients that we were unable to reexamine but about whom follow-up data could be obtained seemed even more favorable than those we did reexamine.

CLINICAL HEMODYNAMIC CORRELATIONS

Observations were made on 13 patients recently hospitalized with acute myocardial infarction to determine whether significant changes in pulse, respiration, or blood pressure occurred when the patient got out of bed and into a comfortable chair. These measurements were made repeatedly while the patient was in bed until fairly constant levels were obtained; then the patient was helped into a chair and these studies were repeated for an average of 77 minutes. The initial set of observations was made within the first three days in the chair, which was, on the average, the fourth hospital day; others were carried out at various stages of the hospital course. One patient who got into a chair on his second hospital day had measurements made during the 1st, 3rd, 5th, 8th, 10th, and 14th days in the chair.

The data of table 2 were obtained in the following way. Separate calculations were made for each of the 38 sets of observations. Five values were obtained: (1) the average of readings with the patient in bed just prior to getting into the chair; (2) the reading immediately after he got into the chair; (3) the average of all readings with the patient in the chair; (4) the lowest blood pressure and the highest pulse and respirations values during the period of observation; (5) the final reading during the period of observation. These five values from each of the 38 observations were then averaged to obtain the data listed in table 2.

Thirty-one observations were carried out in 9 patients who survived, and 7 observations were carried out in 4 patients who died during treatment. No significant changes occurred immediately on assumption of the upright posture. The average of all readings in the chair when compared with the average of the readings in bed showed a blood pressure fall of 4 mm. Hg systolic and 4 mm. Hg diastolic. The greatest observed difference between bed values and chair values was a fall of 10 mm. Hg systolic and 8 mm. Hg diastolic, and an increase of 4 pulse beats per minute and 3 respirations per minute. These differences are devoid of any physiological significance. Slightly greater variations were noted in patients who had a fatal outcome.

It was thought that instability of the cardiovascular system might be detectable early in the patient's hospital stay, as manifested by lability of blood pressure, pulse, or respirations; this was not substantiated by our observations. Occasionally blood pressure, pulse, and respirations increased slightly when the patient got into a chair. Usually blood pressure fell a few millimeters and pulse and respirations were essentially unchanged. In a few instances there was as much as 20 mm. decrease in sys-

tolic and diastolic values; this was accompanied by a slight fall in pulse rate and respirations in some but by a slight rise in others. A few who manifested little change in blood pressure had a rise in pulse rate up to 10 beats per minute. There was no consistent change in these values when the patient was moved from bed into a chair other than a very slight fall in blood pressure. Changes were never of a magnitude to warrant returning these patients to bed. Regardless of the readings obtained, while the patients were in the chair a feeling of comfort prevailed. At no time did they experience breathlessness, increased pain, or shock. Though the observations were made over an average period of 77 minutes, the patients usually remained in the chair for several hours until fatigued.

From these data there is no reason to believe that the work of the heart is increased as a result of the change from bed to chair, or as a result of remaining in the chair. In fact, the constancy of pulse and respirations when coupled with the slight diminution in blood pressure suggests that the cardiac work load may have been decreased by chair treatment.

TABLE 2.—*Effect of Armchair Treatment on Pulse, Blood Pressure, and Respirations*

	9 Surviving Patients 31 Observations				4 Patients Who Died 7 Observations			
	Blood Pressure, Mm. Hg	Pulse Pressure, Mm. Hg	Pulse Rate, Beats per Min.	Respirations per Min.	Blood Pressure, Mm. Hg	Pulse Pressure, Mm. Hg	Pulse Rate, Beats per Min.	Respirations per Min.
Patient in bed; reading taken just before patient got into chair	112/69	43	84	25	115/83	32	87	18
Reading taken immediately after patient got into chair	113/68	45	84	26	109/79	30	86	19
Average of all readings while patient was in chair; (average observation period 77 min.)	110/66	44	84	25	107/77	30	86	19
Minimum blood pressure and maximum pulse rate and respiration rate during the period of observation	104/63	41	88	28	100/73	27	89	23
Final observation in chair	109/65	44	83	25	106/75	31	82	23

Recently, it has been shown by catheterization studies that the work of the heart of both normal persons and cardiac patients is 23% less when the person is in a chair than when the person is in bed.[3a]

COMMENT

It is emphasized that the chair method of management does not mean early or increased ambulation. The patient is kept just as quiet in the chair as he is in bed, and is not permitted to walk or be mobile earlier.

As soon as the patient arrives on the ward, the house officer explains to him the program of chair management. Otherwise an asymptomatic patient may get out of bed unassisted or walk about without realizing that he is jeopardizing himself unnecessarily and is violating the intended method of management. The nurse continues to observe him carefully throughout his hospital stay to assure his adherence to the desired regimen. Unfortunately it is the attitude of laymen, including ward orderlies and attendants, that if a patient is permitted to be in a chair he cannot be very sick and need not be kept quiet. They believe that anyone who is seriously ill will invariably be kept in bed. The nurse must emphasize to all who have to do with the care of the patient that he is critically ill and must be kept at complete rest for at least three weeks after the acute episode. The patient is usually allowed to feed himself early in his hospital stay, because the amount of effort required for eating is minimal, while the increased comfort and higher morale result in a better appetite. The bedside commode is used. Bed baths are given by the nurse. He generally may comb his hair, but is not permitted to shave himself.

In most cases the patient may be out of bed within the first two days. He remains in the chair as much of the day as he is comfortable, returning to bed when he feels too tired to sit up any longer—usually several hours in the chair during the first day, with increasing time intervals thereafter. With a comfortable chair close to the bedside, the patient is helped to sit up in bed by two people, one on either side. His legs are then dangled over the edge of the bed. He stands, with support on both sides, and is guided and helped into the chair. Care is taken that no pressure is exerted by the chair on the popliteal spaces or calves in order to avoid interference with circulation. He is helped back into bed in the same way when he is tired. There were several instances in which the patient was so ill with pulmonary edema that he was semiconscious and irrational and had to be lifted bodily into the chair.

There may be a difference of opinion as to how long the period of rest treatment should be continued. One may maintain with a good deal of justification that complete rest should be carried on for four, six, or eight weeks. The wisdom of this more lengthy plan of management gains some support from the pathological studies that have been published concerning the healing of myocardial infarction.[4] It would appear from these studies that rest should be advised for four or six weeks, at the end of which time final healing and scar formation are thought to be complete. In any event, the fundamental principle underlying the chair treatment is that whatever period of rest is chosen, it is best achieved with the patient in a chair with the feet down, for in that way heart and mind obtain the greatest degree of rest. As a practical matter, economic and sociologic factors come into play that may lead the physician to shorten this period. Even when this is done, the patient is not permitted much phys-

3a. Coe, W. S.: Cardiac Work and the Chair Treatment of Acute Coronary Thrombosis, Ann. Int. Med. **40**: 42, 1954.

4. Levine, S. A.: Coronary Thrombosis: Its Various Clinical Features, Medicine **8**: 245, 1929. Mallory, G. K.; White, P. D., and Salcedo-Salgar, J.: Speed of Healing of Myocardial Infarction: A Study of the Pathologic Anatomy in 72 Cases, Am. Heart J. **18**: 647, 1939.

ical activity during the first few weeks after the strict rest period has been completed. He then slowly increases his activity and is always advised not to return to his usual pursuits for two to three months.

The group of patients comprising the original 81 cases included a number who were desperately ill. We do not feel that it is possible to make an accurate comparison between this series and others regarding duration of survival and incidence of fatalities, because of the difficulty in finding a truly comparable group of patients who were treated with strict bed rest.

It is difficult to conceive that if this posture is good for the patient in the acute phase of his myocardial infarction and increases his chances of survival, it can possibly make him worse later on. The data obtained from the follow-up study support this view, for there is no evidence to indicate that any patient in this series has been harmed or made worse by the armchair method of treatment. In this regard there was no instance of ventricular aneurysm that could be detected on roentgenologic study in 41 cases seen on the average 26 months after recovery from the acute attack.

Approximately 120 patients at this hospital in addition to the series of 81 patients reported on earlier have been managed by the armchair method. Longer observation continues to validate the view already expressed, that pulmonary congestion is decreased and convalescence speeded by the chair treatment. We feel that this is the treatment of choice for acute myocardial infarction in the absence of contraindications of continuing shock, extreme debility, or concomitant cerebrovascular accident.

SUMMARY

Of the original group of 81 patients with acute myocardial infarction who were armchair-treated, 8 died in the acute attack. A follow-up study of the 73 who recovered shows that within 24 months there have been 17 deaths, including at least one of noncardiac origin. Fifty-six have survived for an average period of 26 months. Forty-two of the 56 survivors were reexamined. There was not a single instance of cardiac aneurysm detectable on careful fluoroscopic examination, although there were nine electrocardiograms with ST segment elevation suggesting ventricular aneurysm. From this study no evidence could be found that the armchair method produced any deleterious long-range effects.

Thirty-eight observations were made on 13 additional patients recently hospitalized with acute myocardial infarction to determine whether significant immediate changes in pulse, respirations, or blood pressure occurred when the patient got out of bed and into a chair. The usual effect was a fall of a few millimeters in systolic and diastolic blood pressure, with little change in pulse or respiration. From these observations it would appear that the heart is not put to increased work by the patient getting into a chair or remaining there.

The armchair management does not involve earlier or greater ambulation than the traditional strict bed rest regimen. Increasing experience validates the opinion that this method of treatment is superior to the traditional strict bed rest regimen.

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LIPOPROTEIN STUDIES IN DIABETICS WITH ARTERIOSCLEROTIC DISEASE

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While the pathogenic mechanism responsible for the development of human arteriosclerosis still remains obscure, certain dominant features stand out as playing a role in the development of this morbid condition. Intramural bleeding with resultant inflammatory changes accompanied by deformity of the arterial coats and encroachment on the lumen appears to be one established feature of arteriosclerosis.[1] Alterations in the metabolism of cholesterol with an abnormal accumulation of various components of lipids and lipoproteins appear also to play an important part in the development of this disease.[2] The higher content of cholesterol in arteriosclerotic coronary arteries makes it necessary to seriously consider a derangement in cholesterol metabolism as a significant factor in atherogenesis.[3] However, whether these abnormal accumulations of lipids represent etiological factors or are a biological accompaniment of arteriosclerotic disease has not been established. Certainly the experimental attempts to induce atherosclerosis in animals by means of increasing cholesterol loads in the circulation have not been particularly successful so far as creating lesions that could be definitely regarded as a counterpart of human arteriosclerosis.[4]

Nevertheless, the contributions made by Gofman and his group in finding an abnormal accumulation of certain molecular sizes of lipoprotein in atherosclerosis has added significantly to a possible clarification of the causes of this disorder. By means of ultracentrifugal techniques, these investigators found that the molecular size of lipoproteins in the serum having a flotation rate of the Sf 12-20 class showed an abnormally higher concentration

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This paper was presented before the American Society for the Study of Arteriosclerosis, Nov. 2, 1953. The study was aided by a grant from the Women's League for Diabetic Research. Technical assistance was given by Christine Palazzo and Dinah Sussman, and Mr. Herbert Marks, statistician for the medical department of the Metropolitan Life Insurance Company, helped to evaluate the results.

Owing to space limitations, seven tables have been omitted from THE JOURNAL and will appear in the authors' reprints.

1. (*a*) Paterson, J. C.: Vascularization and Hemorrhage of the Intima of Arteriosclerotic Coronary Arteries, Arch. Path. **22**: 313 (Sept.) 1936. (*b*) Winternitz, M. C.; Thomas, R. M., and LeCompte, P. M.: The Biology of Arteriosclerosis, Springfield Ill., Charles C Thomas, Publisher, 1938.

2. Hirsch, E. F., and Weinhouse, S.: The Role of the Lipids in Atherosclerosis, Physiol. Rev. **23**: 185, 1943.

3. Morrison, L. M., and Johnson, K. D.: Cholesterol Content of Coronary Arteries and Blood in Acute Coronary Thrombosis, Am. Heart J. **39**: 31, 1950.

4. Moschowitz, E.: Hyperplastic Arteriosclerosis Versus Atherosclerosis, J. A. M. A. **143**: 861 (July 8) 1950.

in patients with arteriosclerotic heart disease than in those free of it.[5] According to these investigators, 10 times as many males as females reaching maturity have an abnormal concentration of these aggregates. They found also that persons with diabetes and obese persons possess these same characteristics.[6] On the basis of these findings they concluded that these molecular fractions play an etiological role in atherogenesis. These investigators indicate that an analysis of the blood serum for abnormal concentration of lipoproteins could serve as a useful tool for predicting those persons destined to develop atherosclerosis. If these findings are true, then the resulting pursuit for methods to control the abnormal concentration of these components possesses clinical implications of the first magnitude from the standpoint of both the prevention and cure of arteriosclerosis. The recent finding that heparin has the property of clearing the serum of the high concentration of neutral fat that develops after a fat meal [7] and the subsequent finding by Gofman and his group that heparin serves also as a clearing agent of atherogenic lipoproteins is a case in point.[8]

It was on the basis of these developments that we were stimulated to pursue a study in a group of diabetics in whom definitive manifestations of arteriosclerotic disease had already developed in order to (1) determine their base line content of circulating lipoproteins and (2) observe the effect of clearing agents on these components.

METHOD

In order to compare our results with normal standards we found it necessary to use those established by Gofman as the largest and most intensively studied series. The validity of our results as a basis for comparison with Gofman's results was established by having the analysis of our samples made by the Institute of Medical Physics. Dr. Gofman, a director of this institute, informed us that the determinations were valid and equal in accuracy to those performed in the Donner Laboratory at the University of California.

Fifty-three diabetics were selected, in whom clear-cut evidence of the presence of advanced arteriosclerotic disease was documented in each case. There were 34 men and 19 women in the series. They were all under 70 years of age, distributed as follows: 9 patients were under 50 years of age, 20 were between 50 and 59, and 24 patients were between 60 and 69 years. One patient was a 31-year-old diabetic man with nephropathy, retinopathy, hypertension, and myocardial infarction from a recent coronary thrombosis. None of the patients selected were suffering from any acute complication that may have interfered with their receiving an adequate food intake. Among the criteria employed to establish the existence of arteriosclerotic disease in these cases were radiological visualization of calcified arteries, funduscopic studies, and clinical syndromes arising from either cerebral hemorrhage or thrombosis, coronary artery thrombosis, or femoral or popliteal artery thrombosis.

All blood samples were drawn in the fasting state, approximately 14 hours after the last meal. This was done to eliminate any possibility of ingested food affecting the concentration of either the Sf 12-20 or Sf 20-100 classes of lipoproteins in the blood.

Although Gofman has indicated that the accuracy of determinations was limited to deviations of 10% and Walker and his associates found deviations of 4.9% in duplicate determinations of the Sf 12-20 class,[9] we decided to establish the validity of our results by subjecting one drawn specimen to triplicate analysis and submitting the specimen in three parts under different names. We also performed, in a group of patients, repeat determinations at approximately weekly intervals in order to learn of any periodic fluctuations in the content of the lipoproteins of the blood.

RESULTS

A summary of the cases listing the diagnosis and the content of the Sf 12-20, 20-100, standard 0-12, and standard 12-400 classes of lipoproteins are recorded in table 1. In plotting these results on the curves for normal persons established by Gofman, it will be seen that the results in our cases are generally evenly distributed along the curve for his group of normal persons. This is particularly true for the Sf 12-20 class (fig. 1). With regard to the Sf 20-100 class, it will be seen that the majority of

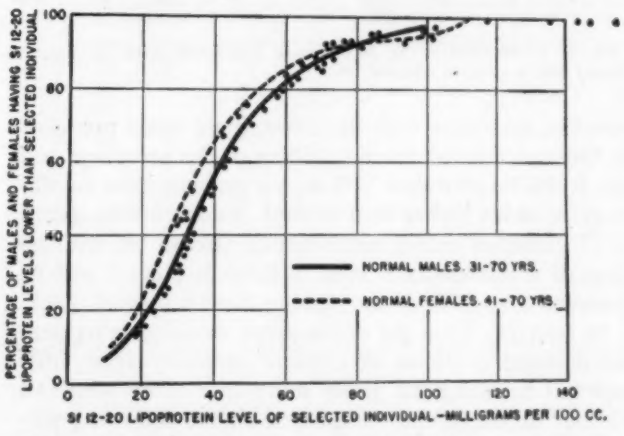

Fig. 1.—Comparison of Sf 12-20 lipoprotein levels in normal persons and in patients reported on.

patients have values less than those found in 70% of Gofman's normal persons (fig. 2).

Gofman has recently indicated that the predictability for atherogenesis can be established better from a calculated index based on the standard Sf 0-12 and 12-400 classes of serum lipoproteins. He finds that the intrinsic value of 1 mg. per 100 cc. of standard Sf 12-400 lipoproteins is 1.75 times as important for atherogenesis as is 1 mg. per 100 cc. of standard Sf 0-12 lipoprotein. By a simple calculation according to the formula:

$$\frac{\text{1 mg. per 100 cc. Sf 0-12} + (1.76 \times \text{1 mg. per 100 cc. Sf 12-400})}{10}$$

he arrives at a figure that he identifies as the atherogenic index.

5. Gofman, J. W., and others: The Role of Lipids and Lipoproteins in Atherosclerosis, Science **111**: 166, 1950.
6. Gofman, J. W., and others: Blood Lipids and Human Atherosclerosis, Circulation **2**: 161, 1950.
7. Hahn, P. F.: Abolishment of Alimentary Lipemia Following Injection of Heparin, Science **98**: 19, 1943.
8. Graham, D. W., and others: Blood Lipids and Human Atherosclerosis: The Influence of Heparin on Lipoprotein Metabolism, Circulation **4**: 666, 1951.
9. Walker, W. J., and others: Effect of Weight Reduction and Caloric Balance on Serum Lipoprotein and Cholesterol Levels, Am. J. Med. **14**: 654, 1953.

We have broken down our series into two major groups, those diabetics with arteriosclerotic disease who in addition show clear-cut signs of diabetic nephropathy (Kimmelstiel-Wilson syndrome), and those diabetics with arteriosclerotic disease who show no evidence of diabetic nephropathy. In table 2 are seen the data for 32 diabetics with nephropathy with a record of their lipoprotein content and calculated atherogenic index, prepared by the Institute of Medical Physics. These are compared in each case with the atherogenic index prepared by Gofman for the normal person of the same age and sex. It will be seen that 72% of our patients have an atherogenic index higher than normal. A comparable record of 25 diabetics with arteriosclerotic disease but with no signs of nephropathy is seen in table 3. Here it will be observed that 67% of the patients have a normal index.

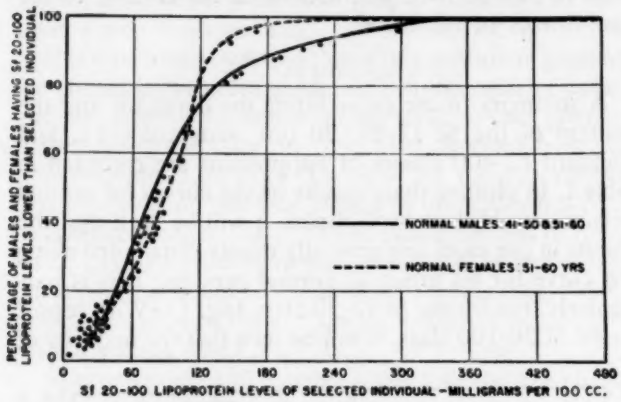
PERCENTAGE OF MALES AND FEMALES HAVING Sf 20-100 LIPOPROTEIN LEVELS LOWER THAN SELECTED INDIVIDUAL
NORMAL MALES 41-50 & 51-60
NORMAL FEMALES 51-60 YRS
Sf 20-100 LIPOPROTEIN LEVEL OF SELECTED INDIVIDUAL—MILLIGRAMS PER 100 CC.

Fig. 2.—Comparison of Sf 20-100 class lipoprotein levels in normal persons and in patients reported on.

In selecting from the entire series those patients with documented evidence of organic coronary artery disease but breaking the group down into those with and without nephropathic complications, the following picture is presented: In table 4 are seen 15 diabetics with coronary artery disease and with nephropathy. It will be noted that 86% have an abnormally elevated atherogenic index. However, it will be seen in table 5 that in 13 diabetics with coronary artery disease but no nephropathy, 12, or 92%, have a normal atherogenic index.

TABLE 6.—*Summary of Calculated Atherogenic Index of Serum Lipoproteins Based on Comparison with Gofman's Normal Index*

	Total Number of Cases	Normal Atherogenic Index: Number of Cases	Normal Atherogenic Index: %	Elevated Atherogenic Index: Number of Cases	Elevated Atherogenic Index: %
Diabetes with arteriosclerotic disease with nephropathy	32	9	28	23	72
Diabetes with arteriosclerotic disease without nephropathy	21	14	67	7	33
Diabetes with coronary artery disease with nephropathy	15	2	14	13	86
Diabetes with coronary artery disease without nephropathy	13	12	92	1	8

In table 6 is seen a summary of all those figures. It is quite apparent that over 72% of the diabetics with arteriosclerotic disease, including those with coronary artery disease who have nephropathic complications, have an abnormally elevated atherogenic index. It is also apparent that the diabetics with arteriosclerotic disease including coronary artery disease but without nephropathic complications possess, in over 67% of the cases, a normal atherogenic index.

In studying the accuracy of the results, it will be seen from table 7 that a determination of a single blood sample performed in triplicate gave a deviation of 28% for the Sf 12-20 class and 1% for the Sf 20-100 class. It will be noted that the atherogenic index deviated by 7%.

In table 8 are seen the variations in the results obtained on the same patient when blood was drawn at intervals of five days to two weeks. It will be observed that variations in the concentration of the lipoproteins of the Sf 12-20 class were as great as 32% and the calculated atherogenic index varied as much as 35%.

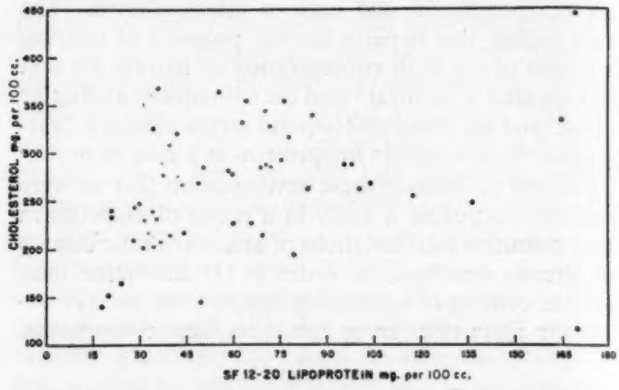

Fig. 3.—Correlation of high levels of Sf 12-20 lipoproteins with high levels of cholesterol.

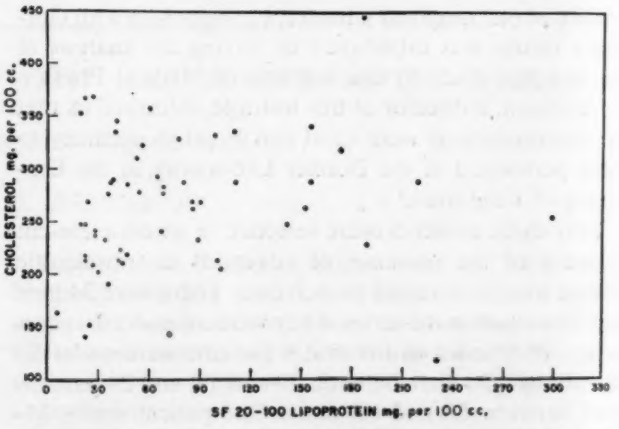

Fig. 4.—Correlation of high levels of Sf 20-100 lipoproteins with high levels of cholesterol.

In plotting the Sf 12-20 values against serum cholesterol, one notes that there is a tendency for the lipoproteins to be at levels higher than normal in those patients with higher serum cholesterol (fig. 3 and 4). A similar correlation is seen in plotting the Sf 20-100 class against the atherogenic index (fig. 5). It would appear that the higher the cholesterol, the higher the lipoprotein values. This has been observed by Gofman [5] and also noted by Walker.[9]

COMMENT

Since this was a highly selected group of diabetics who all showed manifestations of advanced arteriosclerotic disease, it was expected that there would be an elevation of the lipoprotein of the Sf 12-20 class and the athero-

genic index. Certainly, if these lipoprotein aggregates are to serve as an index of atherogenesis, this would have to be the case.

However, the results of this study do not seem to bear this out. In the first place, it will be observed that when our patients are plotted against Gofman's normal patients for content of Sf 12-20 lipoproteins, they all fall along his normal curve except for five patients. When compared with the index that he derives and considers as occurring in the normal, it is seen that 40% of our series have an atherogenic index that is normal. However, in breaking down our series and excluding those patients with a renal complication commonly recognized as diabetic nephropathy or the Kimmelstiel-Wilson syndrome, then it is seen that 67% have a normal index.

This is in keeping with some of the reports that have recently appeared in the literature. Engelberg and others studied 17 diabetics with nephropathy and found an abnormal elevation of the lipoproteins of the Sf 12-20 class. They found, too, that these patients had very high serum cholesterol levels.[10] Similarly, Keiding and his group indicated that there appeared to be a relationship between the high Sf 12-20 lipoproteins and the high serum cholesterol level in 26 cases of diabetic nephropathy.[11]

Furthermore, Hanig and Lauffer studied diabetics free from diabetic nephropathy and found that the mean of means in their series of the Sf 12-20 class of lipoproteins was equal to 40.1 mg. per 100 cc. with a standard deviation of 22.1.[12] This agreed with the figure found by Gofman in the normal person. They even observed that uncooperative diabetics had normal figures. They concluded that there was no difference in the Sf 12-20 lipoproteins between normal persons and diabetics who cooperated or not, when the figures were subjected to careful statistical scrutiny.

While these observations are significantly important, it should be stressed that similar findings by us were made in diabetics who already show advanced atherosclerotic disease. It would seem from this that the significance of the concentration of the serum lipoproteins as determined by ultracentrifugal techniques needs to be further evaluated.

It would appear to us that the reason may lie in the fact that no satisfactory figure for the true normal has been established. Gofman's selection of patients with clinical manifestations of coronary artery disease as representing patients with atherogenic activity as opposed to all the others studied as presumably nonatherosclerotic does not appear to be wholly acceptable.

There can be little doubt that arteriosclerosis is a disseminated systemic disease affecting all the arteries of the body and creating symptom syndromes in a variety of anatomic sites, depending on where blood flow becomes embarrassed from encroachment by a diseased arterial coat on the arterial lumen. Such alterations in arteries are frequently indistinguishable histologically whether they occur in the coronary, renal, splenic or cerebral artery or in the artery of an extremity. Certainly those who look on circulating lipids as playing a major role in the etiology of arteriosclerosis cannot deny the systemic character of this disease.

Under such circumstances it appears to us that a better understanding of the significance of the levels of blood lipoproteins could be obtained if one compared the blood content of these substances in persons with arteriosclerotic disease, regardless of where it is found in the body, with those persons who are totally free of arterial degeneration.

It would indeed be a difficult, if not impossible, task to collect such a series of normal persons, particularly in view of the fact that atherosclerotic disease can be present in the young without being clinically detected and found only at the autopsy table. The recent report of Enos and his co-workers stated that in autopsies of 300 soldiers killed in the Korean war, 77% showed anatomic evidence of atherosclerotic disease of the coronary arteries, despite the fact that their average age was 22 years.[13] These persons were totally without symptoms before death and yet showed intimal thickening and atheromatous deposits in the coronary arteries.

It would, therefore, appear to us that a clearly defined figure for the normal concentration of the variety of molecular aggregates of lipoproteins identified by means of the ultracentrifuge is not available at present. It is even possible that what we regard as normal figures may ultimately prove to be abnormally high and is not unlike the

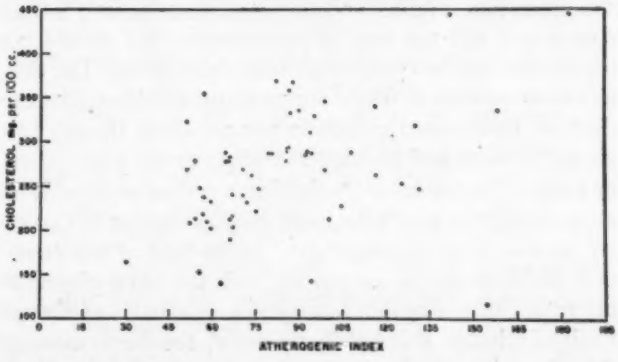

Fig. 5.—Correlation of high cholesterol values with atherogenic index.

concept that Gubner and Ungerleider present regarding serum cholesterol.[14] These authors indicate that levels we accept as normal are probably abnormally elevated and atherogenic. They point to serum cholesterol levels below 100 mg. per 100 cc. in persons who are totally free of atherosclerosis.

SUMMARY AND CONCLUSIONS

An analysis of the circulating lipoprotein aggregates of the Sf 12-20, Sf 20-100, Standard Sf 0-12, and Standard Sf 12-400 classes is presented in 57 diabetics with clearly defined arteriosclerotic disease. It is found that these components fall largely into categories described as normal by Gofman and his associates in those diabetics who are free of diabetic nephropathy.

123, 8th Ave. (Dr. Collens).

10. Engelberg, H.; Gofman, J. W., and Jones, H.: Serum Lipids and Lipoproteins in Diabetic Glomerulosclerosis: Preliminary Observations of the Effect of Heparin upon the Disease, Diabetes **1**: 425, 1952.

11. Keiding, N. R., and others: Serum Lipoproteins and Cholesterol Levels in Normal Subjects and in Young Patients with Diabetes in Relation to Vascular Complications, Diabetes **1**:434, 1952.

12. Hanig, M., and Lauffer, M. A.: Ultracentrifugal Studies of Lipoproteins in Diabetic Sera, Diabetes **1**: 447, 1952.

13. Enos, W. F.; Holmes, R. H., and Beyer, J.: Coronary Disease Among United States Soldiers Killed in Action in Korea: Preliminary Report, J. A. M. A. **152**: 1090 (July 18) 1953.

14. Gubner, R., and Ungerleider, H. E.: Arteriosclerosis: A Statement of the Problem, Am. J. Med. **6**: 60, 1949.

THE PROBLEM OF THE FOREIGN PHYSICIAN

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It is well known that a large number of foreign physicians have come to this country in recent years. This problem touches all of us in one way or another, whether as competition in earning a livelihood or in terms of responsibility for training foreign interns and residents. At the Congress on Medical Education and Licensure, held in Chicago in February, it was a chief topic for discussion. It is therefore not inappropriate for all of us to learn something about this matter, and it may be appropriate for some of us to do a little soul-searching, because in many instances the handling of these foreign physicians has been awkward and unfortunate.

At the outset I would like to set down a few premises. Columbia University is very much interested in the problem of the foreign trained. Traditionally, Columbia has on its campus more foreign students in various disciplines than any other university campus. It is no accident that International House is on Morningside Heights. Another statement that is quite obvious yet needs to be said is this: America is still the land of opportunity. We should not forget that our own ancestors were immigrants. The definition of an alien is this: "An unnaturalized foreign resident. A naturalized citizen is not an alien, though foreigner by birth and perhaps a stranger in the place where he resides. A person of foreign birth not naturalized is an alien, though he may have been long resident in this country, and ceases to be a stranger." In the light of this definition our concern is not strictly with the alien physician but rather with a broader category—graduates of foreign medical schools. It is hardly necessary for me to mention that Canadian medical schools are not considered foreign; in addition, there is not today in the United States or Canada an unapproved or second class medical school.

With these preliminary observations let us proceed to the problem and try to define it. Immediately we must admit that the problem defies sharp definition. It is not easy to get at reliable data, and such data as we are able to obtain are likely to be incomplete in one respect or another and there is an uncertain amount of overlapping in the data from various sources. I will present all the data available to me, and, from this, individual opinions can be formed. It is convenient to consider this problem from at least two aspects: first, those graduates of foreign medical schools who have migrated to this country as displaced persons or otherwise, and, second, those physicians who have come here ostensibly for graduate training and who may return home.

Read before the alumni of Bellevue Hospital, New York, March 3, 1954.

Associate Dean, Graduate Studies, Columbia University College of Physicians and Surgeons.

1. Ezell, S. D.: The Evaluation of Foreign Medical Credentials, Fed. Bull. **40**: 36 (Feb.) 1954.
2. Killough, R. C., Jr., and Ezell, S. D.: Licensure Problems of the Foreign Medical Graduate, Hospitals **26**: 102 (Nov.) 1952.
3. Medical Licensure Statistics for 1952, Council on Medical Education and Hospitals, J. A. M. A. **152**: 415 (May 30) 1953.
4. Burgess, A. M., and Graef, I.: Foreign-Trained Physicians, Correspondence, J. A. M. A. **152**: 1260 (July 25) 1953.
5. New York Times, Feb. 25, 1954.
6. Becker, A. G.: Personal communication to the author.

IMMIGRANT PHYSICIANS

With respect to those physicians who have presumably come to stay, Dr. Stiles Ezell, secretary of the New York State Board of Medical Examiners, recently stated that some 20,000 foreign-trained physicians had migrated to the United States.[1] The figure was not documented, but there is additional evidence that would tend to support this estimate. Dr. Ezell and Assistant Commissioner of Education Robert Killough in an earlier statement declared that, in the period from 1931 to 1951, there were admitted to the licensure examinations in New York State 11,300 foreign medical graduates, with 3,000 being refused examination.[2] This is for New York State alone. It was stated that the national total examined during this period was 18,000 foreign graduates. This trend still continues, and in 1952, according to the American Medical Association,[3] 1,208 foreign graduates were examined; this group included 427 (35% of the total) in New York State. Thus the figure of 18,000 until 1951 has pretty surely gone beyond 20,000 now. Incidentally, of the 1,208 foreign graduates examined in 1952, 46.3% failed as compared with a failure rate for graduates of approved American medical schools of 1%. It is not clear how many physicians took the examination in more than one state or in one state on more than one occasion so that other data are necessary.

The National Committee for Resettlement of Foreign Physicians has assisted over 10,000 physicians in the past 15 years. Between 1939 and 1942 they registered about 7,000 immigrant physicians, mostly from Germany and Austria.[4] In a recent news dispatch this committee reported that there continues to be 500 to 700 immigrant physicians registering per year.[5] Another organization interested in this problem is the International Rescue Committee with offices in New York. This group, supported at one time by a $500,000 grant from the Ford Foundation has facilitated the immigration of over 2,000 carefully screened professional persons, a fair number of whom are physicians.[6] A large number of these physicians have settled in the New York area.

Most of the physicians brought in by these two altruistic agencies have been from central and eastern Europe. Obviously this is only part of the picture. To supplement these data information has been collected from other sources that offer a little more background information on the individual physicians. The first inquiry was as to who are being admitted to the county medical society and who are enrolling in postgraduate medical courses. In *New York Medicine,* the bulletin of the New York County Medical Society, there are published at intervals the names of candidates and applicants for membership in this largest county medical society in the country. During the calendar year 1953, there were listed 365 names of applicants for membership in the county society including 111 who were graduates of foreign schools. These listings include duplications since an applicant is not necessarily recommended for candidacy

after his first listing; however, most are eventually accepted. Eliminating duplications we find the names of 62 graduates of 40 foreign schools. Of these 40 foreign schools, 34 do not appear on the latest list of foreign schools about the current status of which the American Medical Association has sufficient information to recommend them.[7]

What can be learned from examining the list of physicians who are taking postgraduate courses? With the cooperation of the several medical schools in New York City information has been assembled about graduates of foreign medical schools who were enrolled in postgraduate courses in five schools during the years 1951-1952 and 1952-1953. It would be meaningless to state the total number of enrollments, since there would be a large duplication because many physicians took more than one course during this period. However, it can be stated that during these two years, in New York City alone, physicians who took postgraduate medical courses included graduates of not less than 150 different foreign medical schools. There are only 39 approved foreign medical schools on the list of the A. M. A. (or 50 if the 12 hospital schools of the University of London are listed separately), so that the 150 foreign schools represented include 21 of the schools on the A. M. A. list and 129 schools that do not appear on this list; these 129 unlisted schools include 42 in central and eastern Europe, 32 in the Near East and Far East, 32 in Latin America, South America, and Spain, 15 in Italy, and 8 in Great Britain. It can be seen that there are many more represented beyond those of central and eastern Europe.

FOREIGN INTERNS AND RESIDENTS

On this subject more accurate data are available, but even these are incomplete. For the last four years in relation to the so-called Doctor Draft Law, the Health Resources Advisory Committee in Washington has been collecting from American hospitals information about their house staffs. The Institute of International Education in cooperation with the American Medical Association has collected similar data during the current year. Information has been furnished privately to me by both these sources and taken together gives a fairly comprehensive picture. The data collected by the Health Resources Advisory Committee are indicated in table 1.[8]

The important thing to note is the steady increase in the number and percentage of "aliens" during these last four years, from 8.5% to 22% of the house staff population. The forms on which this information was solicited requested the name of each house staff officer together with data as to sex, prior military service, alien status, etc. The term "alien" in spite of the dictionary definition given at the beginning is interpreted differently by different persons, and there is reason to believe that many listed as aliens are here as immigrants. Age data on 3,112 of the current "alien" residents are available; only 1,353 or 43% are under 30 years of age, 289 or 9% are over 40, and the remaining 48% are between 30 and 39. There is then good reason to believe that many of those listed as aliens are immigrants rather than recent graduates here only for training. Furthermore, female graduates of foreign medical schools are not included in these figures since, for purposes of advising Selective Service, these women are classified together with female graduates of American medical schools as "unavailable" and are not included in the figures for aliens just given. Thus the total figures should be higher.

Fortunately, the Institute of International Education collected its data from the same source (hospitals listed as approved by the A. M. A. for internship and residencies) for the current year but asked hospital administrators to omit names of immigrants, displaced persons, etc., so that this source affords a better idea of the number of interns and residents who might be expected to return to their own country after receiving training. The IIE data are derived from the replies of 769 hospitals to the questionnaire and indicate a total of 2,920 foreign physicians on house staffs. This group includes 356 females. If the same ratio of females can be assumed to prevail throughout, the figures in table 1 can easily be adjusted to reach a safe conclusion that over 6,000 of the total number of interns and residents in this country today are graduates of foreign medical schools, i. e., about 25% of the total number of interns and residents on duty.

Distribution.—Where are these foreign interns and residents? The IIE data show that they are distributed in 40 states and the District of Columbia. Although the IIE total is probably only half of the national total as reported to the Health Resources Advisory Committee, nevertheless, table 2 lists the 12 states having the largest number of "alien" interns and residents, as reported by the IIE. The only previous survey of this kind analyzed the situation for 1951-1952, based on the complete data of the Health Resources Advisory Committee of the Office of Defense Mobilization.[9] That report included a chart of states having 500 or more interns and residents, showing aliens as a percentage of the total house staff. It is worth noting that the first 12 states in the previous study are exactly the same as the 12 in table 2 though in a slightly different order, because the chart in the earlier report was based on the percentage of aliens rather than the total number of aliens in the house staff. New Jersey, which ranked highest in the previous study, would continue to be first on a percentage basis. Thus there seems to have been established a pattern of distribution of foreign interns and residents. The greatest concentration is in the northeastern part of the United States, and the

TABLE 1.—*Number of Aliens in House Officer Positions**

Year	Total	First Year Interns	Residents and Fellows
1950-51	24,442 2,072 (8.5%) aliens	6,287 722 (11.6%)	18,205 1,350 (7.4%)
1951-52	22,918 3,349 (14.6%) aliens	6,783 1,116 (16.5%)	16,135 2,233 (13.8%)
1952-53	23,221 4,388 (18.9%) aliens	6,990 1,353 (19.4%)	16,231 3,035 (18.7%)
1953-54 †	24,790 5,459 (22%) aliens	7,291 1,770 (24.2%)	17,499 3,689 (21%) ‡

* Federal hospitals are not included in these data furnished by the Health Resources Advisory Committee.
† Extended estimate based on 95% returns.
‡ This group includes 3,112 whose age is known: 1,353 under age 30, 1,470 aged 30-39, and 289 over age 40.

7. Foreign Medical Schools, list prepared by the Council on Medical Education and Hospitals of the American Medical Association and the Executive Council of the Association of American Medical Colleges, J. A. M. A. **153**: 133 (Sept. 12) 1953.
8. Barton, P.: Personal communication to the author.
9. West, M. D.; Barclay, R. W., and Crosby, E. L.: An Inventory of Hospital Staffs, Hospitals **26**: 63 (Dec.) 1952.

largest number considered either as percentages or as simple aggregates are found in those states having the largest number of house staffs on duty.

There are no significant data previously available as to where these "alien" interns and residents come from. The group on whom IIE has assembled data is large enough to be significant. They come from the 82 countries listed in table 3. Since the World Health Organization lists medical teaching institutions in 84 countries and territories (including the United States and Canada), the comprehensiveness of this list is apparent. About one-fourth come from the Orient, including the Philippines; about one-tenth come from the Near East; and about one-fifth come from Latin America, including Mexico. Two-thirds of them come from 11 countries ranking in order as follows: the Philippine Islands (429), Canada (354), Mexico (255), Germany (156), Turkey (145), Italy (139), China (119), India (114), Cuba (87), United Kingdom (80), and Japan (77).

TABLE 2.—*States with Largest Number of Alien Interns and Residents**

New York	635	Maryland	125
Ohio	308	Minnesota	116
New Jersey	225	Missouri	108
Massachusetts	222	Michigan	99
Illinois	206	California	93
Pennsylvania	145	Texas	81

* These data were provided by the Institute of International Education.

Return to Homeland.—Present experience leads to the warning that it would be extremely unwise to assume that all of the 2,920 aliens listed by the IIE will return to their native land. For example, I recently visited a small hospital in the metropolitan area that has an entirely foreign staff of five "residents." One, a Russian, is an immigrant. One is a Chinese who has been here for three years and does not have an immigrant's visa but is not allowed to return home because of the policy of our government in handling Chinese nationals. There are three young men who recently arrived, one from Ceylon and two from India. Each of these three insisted that he intended to return home after receiving training of at least two years and preferably three. Each one had come here on an immigrant's visa "for convenience." To review the status of this group: of the five foreign graduates on this small hospital staff, only one acknowledges status as an immigrant, but three others have immigrant visas, and none are compelled to return home. This is true of many hospitals, and it is very probable that the great majority of the 6,000 foreign graduates known to be in hospitals today will remain here. Experience has shown that when a physician stays here more than a year he is not very anxious to return home, and if he stays more than two years he is extremely reluctant to return home. This is not just my opinion, it is the experience of many foreign student advisors.[10] Incidentally, Bellevue Hospital for the current year has a house staff of 372 persons including 67 "aliens" from at least 11 countries. This figure of 18% is not far from the average for New York, although many smaller hospitals have 100% foreign-trained house staff.

10. Report of the Committee on International Relations in Medical Education, Association of American Medical Colleges, J. M. Educ. **28**:49 (Dec.) 1953.

11. Manlove, F. R.: American Students in Foreign Medical Schools, J. A. M. A. **150**: 70 (Sept. 13) 1952.

AMERICANS STUDYING MEDICINE ABROAD

Another aspect of this over-all problem has to do with the significant number of American students who, unable to obtain admission to American medical schools, travel abroad for medical training and, of course, return home to practice. The most recent published information on this element of our problem is the study of Dr. Manlove.[11] This study revealed that in the year 1951-1952 there were 1,121 Americans enrolled in 78 medical schools in 21 foreign countries. This figure is a minimum as was pointed out by many of the persons who discussed his paper and confirmed by the fact that 52 of the 176 medical schools to which inquiry was directed neglected to answer Dr. Manlove's questionnaire.

Although the problem is acute at the moment, this is not exactly a new development. In the early 1930's there were a significant number of Americans who went to Europe to study medicine, possibly because of the economic depression at that time. Indeed, in 1934 the Federation of State Medical Boards passed a resolution to the effect that the federation recommend to its constituent state boards and to the National Board of Medical Examiners that, until adequate information becomes available, these boards deny graduates of foreign medical schools admission to the various medical licensure

TABLE 3.—*Origin of Alien Interns and Residents**

Afghanistan	3	Israel	22
Albania	1	Italy	139
Argentina	47	Jamaica	7
Australia	22	Japan	77
Austria	25	Jordan	1
Barbados	1	Korea	68
Belgium	14	Latvia	2
Bolivia	4	Lebanon	26
Brazil	59	Lithuania	3
British West Indies	1	Luxembourg	1
Burma	1	Malta	1
Canada	354	Mexico	255
Chile	4	New Zealand	1
China	119	Netherlands	42
Colombia	52	Nicaragua	16
Costa Rica	7	Nigeria	1
Cuba	87	Norway	12
Cyprus	1	Pacific Islands	1
Czechoslovakia	5	Pakistan	7
Denmark	4	Paraguay	1
Dominican Republic	16	Peru	27
Ecuador	19	Philippines	429
Egypt	11	Poland	5
El Salvador	5	Portugal	12
Estonia	5	Puerto Rico	2
Finland	2	Rumania	1
Formosa	9	Russia	8
France	12	Somalia	1
Germany	156	Spain	35
Greece	61	Sweden	3
Guatemala	9	Switzerland	34
Haiti	10	Syria	10
Honduras	6	Thailand	17
Hungary	5	Trinidad	3
Iceland	6	Turkey	145
India	114	Union of South Africa	14
Indonesia	3	United Kingdom	80
Iran	74	Uruguay	1
Iraq	23	Venezuela	15
Ireland	20	Yugoslavia	2

* These data were furnished by the Institute of International Education.

examinations. Data for the early peak period are listed in table 4 together with available recent information.

In table 5 is assembled information on those five countries that accepted the largest number of American citizens in the years for which such information is available. For the five year period from 1930 to 1935, since the enrollment figures obviously are not cumulative, an average figure has been derived from the source data [12] based on the total for each country over the five year

TABLE 4.—*Americans in Foreign Medical Schools*

Year	Number Enrolled	Number Graduated
1930-31	710	46
1931-32	1,206	56
1932-33	2,054	88
1933-34	1,940	104
1934-35	1,471	199
1951-52	1,121	...

span. The change in distribution of students subsequent to World War II is interesting. All 222 American citizens studying medicine in Spain and 54 of the 78 in Mexico were Puerto Ricans. Presumably a large number of these were studying under the "G. I. Bill." For the current year, 1953-1954, the Institute of International Education has begun to collect information on American students abroad. The data are incomplete and are collected in such a fashion that inclusion in table 5 would be misleading. However, the data suggest that Mexico continues to rank among the first five. The data also indicate that 20 American citizens are studying dentistry abroad—16 in Peru, 2 in Mexico, and 2 in Australia. With assistance from the United Nations Educational, Scientific, and Cultural Organization, the IIE will probably have more comprehensive information in future years.[13]

FOREIGN STUDENTS STUDYING MEDICINE IN AMERICA

In order to visualize the other side of this coin we have assembled from the annual "Educational Number" of THE JOURNAL during the past 20 years information about foreign students who have been admitted to American medical schools. These data are listed in tables 6 and 7. From 1942 on, the figures represent literal aliens, those whose permanent residence is indicated to be in a foreign nation. For the first two years, 1942 to 1944, the figures represent the total number aliens enrolled. For all sub-

TABLE 5.—*Distribution of American Medical Students Abroad*

1930-35	(Average)	1951-52	
Scotland	370	Switzerland	363
Switzerland	269	Spain	222
Germany	255	Italy	134
Italy	193	Netherlands	74
Austria	170	Mexico	78

sequent years the figures represent only the freshman class. Thus the figures for nine years, 1944 to 1953, are cumulative (total 520); if the total enrollment for the year 1943-1944 is added, this represents 700 aliens known to have been enrolled in American medical schools in the past 10 years. Prior to 1942 the listing indicated "foreign born" and obviously included both aliens and immigrants. The figures in table 7 are for all classes in all medical schools and are not cumulative. In tables 6 and 7 Canadians are not included, nor are students from American territories and possessions.

To complete this side of the picture there is listed in table 8 information from the annual census of foreign students in this country prepared by the Institute of International Education.[14] Only those in medical and allied fields are listed in the table. These data are collected from American educational institutions and thus include trainees in university teaching hospitals who are included in other tabulations of foreign students, interns, and residents. These figures also include Canadians. It should be obvious that there are many many others who are not reported to the institute. This material merely shows

TABLE 6.—*Aliens Enrolled in American Medical Schools*

Year	Total	
1952-53	91	Freshman
1951-52	64	
1950-51	64	
1949-50	57	
1948-49	42	
1947-48	58	
1946-47	54	
1945-46	51	
1944-45	39	
1943-44	180	Total aliens enrolled
1942-43	167	

TABLE 7.—*Foreign-Born Students in American Medical Schools*

Year	Total
1941-42	512
1940-41	456
1939-40	511
1938-39	515
1937-38	569
1936-37	622
1935-36	675
1934-35	725

TABLE 8.—*Medical Science Courses in Which Foreign Students in United States Are Registered**

	1951-52	1952-53	1953-54
Premedicine	591	...	983
General medicine	507	1,253	351
Specialties	311	521	...
Public health	200	100	187
Nursing	372	424	520
Dentistry	310	356	...
Others	460	104	...
Dentistry and others	...	...	770
Total enrolled	2,751	2,818	2,811

* Numbers derived from census taken by the Institute of International Education.

another aspect of this picture and is intended to further dispel any notion that American educational institutions are not doing their share in this phase of international relations.

CONTRIBUTING FACTORS

There are many factors contributing to the magnitude of this problem, some of which are obvious and some perhaps not so obvious. In the first place, America is today the mecca for medicine. The rest of the world looks here as in generations past Americans looked to certain centers in Europe. However, it is a lot easier for those

12. Medical Education in the United States and Canada: Annual Presentation of Educational Data for the Academic Year 1934-35, Council on Medical Education and Hospitals, J. A. M. A. **105**:677 (Aug. 31) 1935.

13. Christie, J.: Personal communication to the author.

14. Education for One World: Annual Census of Foreign Students in Institutions of Higher Education in the United States, 1951-52, New York, Institute of International Education, 1952; ibid. 1952-53; ibid. 1953-54.

who wish to get to America than it was for our forefathers to go to Europe. Secondly, various agencies of our government encourage physicians from all corners of the earth to visit this country. The "Point Four Program" and the Fulbright-Smith Mundt program, often referred to as the "Exchange-Visitor" program, are familiar to most persons; however, few appreciate the number and complexity of the various programs. The State Department alone is responsible for programs established under seven different laws. For example, physicians have been brought here from India subsidized under the Indian Emergency Food Aid Act (or "Indian Wheat Bill"). It is hardly necessary to be reminded that the various programs designed to bring students here apply to many other fields besides medicine, but the proportion of physicians who manage to get in on these various programs is quite high, especially when compared with the extremely small number of physicians among the Americans who go abroad under the "exchange" programs.

A third contributing factor is this: Various foundations and committees including such well-known organizations as the Ford Foundation, Kellogg Foundation, the Committee on International Exchange of Persons, and a very large number of less well-known groups with special interests in particular parts of the world have been promoting similar activities. Many of these organizations use the highly effective service of the Institute of International Education, an organization that attempts to introduced some coordination into this hodgepodge. (The definition of hodgepodge is a pudding made of many mixed ingredients.)

The last factor to be mentioned, and in some respects the most significant, is the fact that the American Medical Association has approved a number of hospital internships and residencies far out of proportion to the number of American graduates who desire such training and, in my opinion, out of proportion to the number of such hospitals that can offer a decent internship or residency program. This has created a vacuum into which many foreign graduates are attracted. It is a fact of interest that many small hospitals in this country are advertising in foreign medical journals to secure interns and residents.

DISTRIBUTION OF PHYSICIANS

What can be done about it? I have no easy solution; I can merely make a few observations and reflections. First, with respect to the consideration of whether foreign physicians who desire to set up practice in this country dilute medical practice and introduce cheap competition, I am no expert in this matter and indeed it does not touch me directly in the shelter of an academic career. However, I was interested to hear a presentation by Frank Dickinson of some challenging data on the distribution of physicians in this country.[15] Many thoughtful observers have expressed the opinion that we have not a shortage of doctors in this country but rather a maldistribution. Dr. Dickinson's group used the technique of market research experts and studied the distribution of physicians by so-called marketing areas or medical service areas that are based on population groups rather than county lines or state lines. The data were collected in the 1950 census. It was surprising to learn how few areas of the United States there are where the ratio of practicing physicians to population is no better than one to 2,000. Indeed if only 361 physicans were shifted, there would have been no area in the nation where the ratio was less than one physician to 2,000 people; if 2,530 physicians were shifted there would have been no area in which there were more than 1,500 persons per physician.

It seems fair to point out that the 165,000 or so practitioners discussed included a significant number of immigrant physicians whose status has already been discussed here. Based on statistics in state licensing boards it is still apparent, however, that these immigrant physicians are highly concentrated in certain areas of the country. It is not necessary to discuss the reasons for this but merely to point out that, of the 1,208 foreign graduates who took state board examinations in 1952, 73% (883) were located in three states—New York, Illinois, and California.[8]

STANDARDS

I am more concerned with the maintenance and improvements of standards of practice and standards of education than with the distribution of physicians. The authorities in the various state boards of medical examiners have been presented with an extremely difficult problem in evaluating the credentials of many of these foreign graduates. Many suggestions have been made, of which I shall mention a few.

It has been proposed that the American Medical Association secure a more accurate and up-to-date appraisal of all foreign medical schools. This is almost impossible as there are listed by the World Health Organization over 400 schools. Another suggestion is that American medical schools accept foreign physicians who have immigrated to this country and admit them to the third or fourth year classes in American medical schools, so that after one or two years of such training they may receive an American degree of doctor of medicine. This would make things a little easier for the state boards of medical examiners, but it is entirely unrealistic in view of the magnitude of the problem as indicated in this report, and there is genuine fear that it would lower the quality of American medical education. The good foreign graduates do not need such training, but the poor ones have much greater deficiencies in the preclinical and basic sciences than they have in the clinical fields. Dr. Ezell recently reviewed the frightful difficulty of evaluating foreign credentials.[1] He reached the conclusion that it is necessary to evaluate persons rather than the schools in which they trained.

Although it may be oversimplification, I would like to stress one principle, namely, that these foreign graduates be required to meet standards just as tough as those our own graduates must meet. In this way, the good ones—and there are many good ones—should not have unusual difficulty and those who are totally unsatisfactory by our standards will not be admitted to practice. There are many lawyers in the United States who have graduated from law school but are unable to pass the bar examination. Nobody seems to get excited over this fact, and most

15. Dickinson, F. G.: Distribution of Physicians by Medical Service Areas, Bulletin 94, Chicago, Bureau of Medical Economic Research, American Medical Association, to be published.

of them make a living in business in spite of the fact that they never practice before the bar. No one suggests that the bar examination be made easier. Everyone who is in a position to do so should in conscience warn prospective foreign visitors of the fact that their path in this country may not be quite as easy as they have been led to believe. It is well to keep in mind also that when we remove physicians from undeveloped areas of the world such as India, which has 15,000 regular physicians for 375 millions of population, we may be doing more harm than good in international affairs.[16]

We should resist every effort to exploit foreign physicians who are in this country for training. Many foreign interns and residents are used in hospitals where they are responsible for menial tasks in the care of an inordinately large number of patients, in return for which they receive little or no training. Even in large centers there have been isolated instances where foreign physicians who sought research opportunties in this country were actually used as technicians. All this is very bad for international relations.

RECOMMENDATIONS

For those who seek training here with the objective of returning to improve the level of medical care in their native lands, the best long-range policy would appear to be to take a limited number of the most promising young medical teachers, bring them to our teaching centers—not to small institutions with no teaching program—and train them to go back to teach American methods. Those foreign graduates who are here to stay, if they are admitted to licensure or are appropriate candidates for licensure, wherever possible should be admitted to post-graduate training opportunities. The local schools have done this as was indicated earlier.

Bellevue Hospital is the scene of two of the most effective programs directed at these two suggested solutions. On the Second (Cornell) Medical Division there has been for the last four years a very effective program, sponsored by the Kellogg Foundation, to offer training to young teachers from Latin America and South America who will return to their native lands. On the Fourth (Postgraduate) Division there is an extensive program that has received support from various sources and was initiated at the request of the New York State Board of Medical Examiners. This is a program of training for selected immigrant physicians whose foreign credentials could not be properly evaluated but who seemed to offer some promise. I point out to you that both of these effective programs have required outside financial support. It is not cheap to conduct an adequate program.

SUMMARY

The problem of the foreign physician is one of magnitude and complexity. Available data indicate that 20,000 immigrant physicians have come to this country in the last 15 or 20 years. About 6,000 or one-fourth of the interns and residents in this country are foreign trained. American medical schools are contributing much more to this aspect of international relations than is generally appreciated. More effective methods of evaluating ability and bestowing licenses to these physicians are necessary.

16. Bowers, J. Z.: Today's Medicine in Underdeveloped Areas, J. A. M. A. **153**: 1167 (Nov. 28) 1953.

HUMAN RABIES

REPORT OF THREE CASES

Ethel E. Erickson, M.D., Peter M. Marcuse, M.D.
and
Béla Halpert, M.D., Houston, Texas

Three patients who presented bizarre symptoms suggesting central nervous system involvement are reported on. In none was the clinical diagnosis of rabies made. At autopsy thorough searching for the cause of death revealed the pathognomonic Negri bodies in the brain tissue. In each instance, subsequent inquiry disclosed that the patient had had direct contact with a suspected rabid dog or had been bitten by a rabid dog.

REPORT OF CASES

CASE 1.—A 29-year-old white man was admitted to the Veterans Administration Hospital, Houston, Texas, on March 28, 1951. He had first complained of pain in the left hand six days previously. In a few hours the pain had radiated into the arm and shoulder, the left side of the chest, and the neck and face and lasted for one day. The next day he had noted a tremor of the left hand with difficulty in raising a glass to his mouth and inability to swallow. On the third day the patient vomited. At first the vomitus was clear, but later it was brown. On the fourth day he was admitted to a local hospital where he was given penicillin and 3 liters of dextrose intravenously.

When the patient was admitted to the veterans hospital two days later he was agitated and confused. The results of physical examination were essentially normal except for gasping respirations and bronchial breathing on the left side. His temperature was 99 F, pulse rate 98, and the blood pressure was 175/105 mm. Hg. Two hours later his temperature rose to 102 F, and the patient became more confused and paranoid.

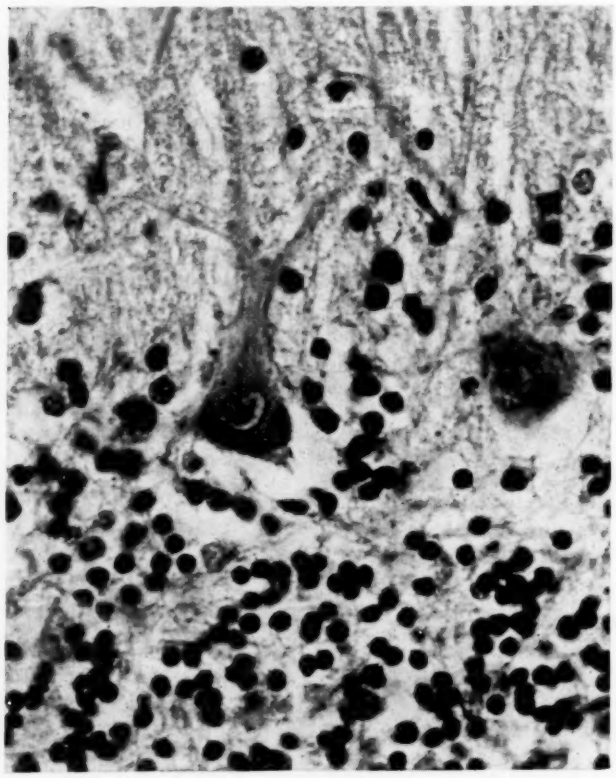
The leukocyte count was 28,100 with polymorphonuclear neutrophils 98% and lymphocytes 2%; the erythrocyte count was 5,420,000 with 15 gm. of hemoglobin per 100 cc. of blood. Urinalysis revealed a specific gravity of 1.026, albumin 4+, glucose 1+, 40 to 50 granular casts per low power field, and 12 to 15 white blood cells per high power field.

On the evening of the day of his admission, while being pushed in a wheel chair, the patient leaped from the chair, resisted restraint, and vomited. He received amobarbital (Amytal) sodium, 3¾ grains (0.24 gm.). Almost immediately he became cyanotic, his blood pressure dropped to 80/45 mm. Hg, and the pulse rate rose to 140 per minute. He was placed in an

From the Department of Pathology, Baylor University College of Medicine (Drs. Erickson, Marcuse, and Halpert), and from St. Joseph's Hospital (Dr. Marcuse) and the Veterans Administration Hospital (Drs. Erickson and Halpert).

oxygen tent and the intravenous administration of fluids was started. At this time the left lung field was dull to percussion, and there were moist inspiratory rales with greatly increased tactile and vocal fremitus. Penicillin, 100,000 units, was given every three hours, and therapy with amobarbital sodium was continued throughout the night because of the patient's aggressiveness and violence. The next morning consolidation in both lungs was noted; the blood pressure was 100/80 mm. Hg and the pulse rate 140. There were no localizing neurological findings nor was there any nuchal rigidity. The patient remained irrational and delirious. The conditions existing in the chest persisted. On the third day after admission the blood pressure was 86/64 mm. Hg and the pulse rate 120. Vomiting continued, respirations were gasping, and the patient died at 7:05 p. m. on March 31, 1951.

At autopsy 16 hours after death, the right lung was found to weigh 720 gm. and the left 640 gm. There was abundant green mucoid material in the bronchi. The cut surfaces of the lungs were deep red-purple, and there were focal firm areas. When the



Negri body in the cytoplasm of a Purkinje's cell of the cerebellum (case 3) (× 556).

lungs were examined microscopically, some air spaces contained neutrophilic granulocytes in a pink coagulum. The changes in the lungs were interpreted as focal pneumonia.

The brain weighed 1,300 gm. The blood vessels on the cerebral hemispheres were markedly distended. On frontal cut surfaces of the cerebral hemispheres there was symmetry of the two sides with good preservation of the gray and white matter. The ependymal lining of the lateral ventricles was slightly discolored yellow-brown. The cut surfaces of the cerebral peduncles, cerebellum, pons, and the medulla oblongata appeared normal. Extensive perivascular infiltration with lymphocytes and plasma cells could be seen microscopically in portions from the cervical spinal cord. Some of the nerve cells of the anterior and lateral horns contained either faded nuclei or none. In the leptomeninx lymphocytes were occasionally visible, with most situated perivascularly. In the medulla oblongata near the olivary bodies similar perivascular infiltrations around vessels were occasionally visible. In the pons there were small foci of extravasated erythrocytes and no perivascular infiltration was noted. In the cerebellum many of the cells of Purkinje contained eosinophilic oval Negri bodies in their cytoplasm. Similar cytoplasmic inclusions were found in nerve cells of the hippocampus. In the cerebral cortex, the cellular and fibrillar pattern appeared as usual with no cellular infiltration noted.

Subsequent inquiry disclosed that the patient's dog had disappeared in February, 1951, about 40 days before the onset of the patient's illness.

Case 2.—A 43-year-old white woman was admitted to St. Joseph's Hospital, Houston, Texas, on Nov. 5, 1952, in a hysterical state. According to her family, she had complained for three days of shortness of breath and generalized muscle cramps, with spasm of the hands and feet. Except for the cramps, she did not complain of pain. She had been anxious, with frequent hysterical outbursts expressing fear of impending death. No further information could be elicited. Physical examination revealed rigidity of the muscles of the neck and jaw, rapid and labored respirations, and fine crepitant rales in the bases of both lungs. The hands and feet were cold. The peripheral pulses were weak. There was marked carpopedal spasm. The biceps and knee reflexes were hyperactive. The temperature was 100 F, pulse rate 108, and the systolic blood pressure 80 mm. Hg, with distant and faint sounds.

The leukocyte count was 9,000 with polymorphonuclear neutrophils 78% and lymphocytes 22%. The erythrocyte count was 4,900,000 with 15 gm. of hemoglobin per 100 cc. of blood. Urinalysis revealed a specific gravity of 1.035, albumin 3+, no glucose, 40 to 60 white blood cells, and 25 to 30 erythrocytes per high power field.

Roentgenographic examination of the chest disclosed bronchovascular markings throughout both lung fields; the appearance was compatible with either pulmonary edema or aspiration.

On the day of admission the patient was restless but was controlled by sedation. The next day she complained of abdominal pain and numbness of the hands. She asked for water, then could not swallow it. On Nov. 7 she became agitated and screamed, complaining of spasms in the upper abdomen and inability to breathe. The blood pressure at this time was unobtainable. The temperature rose to 102 F. The following day the patient became stuporous and died at 7:00 p. m. The day before death the family volunteered the information that 30 days before the onset of her illness the patient was bitten on the leg by a dog.

At autopsy a small discolored area was found over the medial aspect of the left ankle. The right lung weighed 550 gm. and the left 520 gm. The gross and microscopic changes in the lungs were interpreted as focal pneumonia.

The brain weighed 1,320 gm. The convolutions were flattened and the sulci narrowed, particularly over the occipital lobes. The superficial blood vessels were slightly congested. When examined microscopically, in the vermis cerebelli there was distortion of many of the cells of Purkinje. In the cytoplasm of some were eosinophilic oval Negri bodies.

Subsequent inquiry disclosed that the brain of the dog that bit the patient had been examined by the Houston City Health Laboratories, and Negri bodies had been found.

Case 3.—A 37-year-old white man was admitted to the Veterans Administration Hospital, Houston, Texas, on July 27, 1953, in an irrational state. He worked for a chemical company and had been well until July 22, when he complained of headache and dizziness. The following day he had vague abdominal discomfort and did not work. In the evening he felt nauseated and vomited. The next day he vomited about every hour. A physician who did not see the patient prescribed secobarbital (Seconal) suppositories, one to be administered every six hours. On July 25, the patient began to behave in a bizarre fashion and was at times irrational. This was attributed by the physician to oversedation. By evening he became uncontrollable except by cajolery or force. The following day he was quieter but periodically cried and was delirious. Another physician sent him to a hospital where he received sedatives and dextrose intravenously and then he was transferred to the Veterans Administration Hospital.

At the time of admission the patient was acutely ill and irrational. The lips and nailbeds were cyanotic. The temperature was 105.2 F, the pulse rate 150, and the blood pressure 94/50 mm. Hg. There were crepitant rales over the left lung base

posteriorly with dulness in some areas and a few rales over the right middle lobe anteriorly. The results of neurological examination were essentially normal except for disorientation. Urinalysis revealed a trace of albumin and one to two white blood cells per high power field. The leukocyte count was 33,600 and the erythrocyte count 6,120,000 with 18.7 gm. of hemoglobin per 100 cc. of blood. The serum content was 136 mEq. and the potassium content 4.1 mEq. per liter. The blood urea nitrogen value was 37 mg. per 100 cc.; the carbon dioxide content was 19 mEq. per liter, and there were 95 mEq. of chlorides per liter of serum. A smear of the sputum contained gram-positive cocci.

The patient continued to be irrational and belligerent. The blood pressure was maintained with levarterenol (Levophed) in 5% dextrose solution. He was given 600,000 units of penicillin in aqueous solution every four hours and 1 gm. of streptomycin initially, followed by 0.5 gm. twice a day. The patient remained in critical condition, with the blood pressure maintained by continuous administration of levarterenol. On July 28, at 5:00 a. m., the respirations suddenly became gasping, and the patient died.

At autopsy eight hours after death, the left lung was found to weigh 725 gm. and the right 1,200 gm. When examined microscopically, the air spaces in the lungs contained a homogeneous pink coagulum and numerous neutrophilic granulocytes. The gross and microscopic changes in the lungs were interpreted as focal pneumonia.

The brain weighed 1,870 gm. The convolutions were broad and the sulci narrow. There was a cerebellar pressure cone, and there were marked tentorial pressure grooves. On frontal cut surfaces of the cerebral hemispheres, the vascular markings were conspicuous in the temporal lobes, in the basal ganglia, and in the white matter surrounding the posterior horns of the lateral ventricles. A similar accentuation of the vessels was noted in the white matter of the cerebellum. On cut surfaces of the pons there were red-brown areas up to 0.4 cm. in diameter. No change was noted in the medulla oblongata. Microscopic examination showed that the cellular and fibrillar pattern in the medulla oblongata was preserved. Some nerve cells in the olivary bodies contained cytoplasmic inclusion bodies. In the pons there was minimal perivascular infiltration with lymphocytes. In the vermis cerebelli most of the cells of Purkinje contained deep pink Negri bodies in their cytoplasm (see figure). In preparations of tissue from the region of the anterior horns of the lateral ventricles and from the hippocampus, clear zones surrounding the nerve cells were seen. Within the cytoplasm of many of these, pink Negri bodies were noted.

When the patient's wife learned of the findings, she elicited the information that the patient had been bitten on his finger by a dog on May 20, 1953, 62 days prior to the onset of his illness. The bite was severe enough so that a fellow worker was asked by the patient to bandage the finger, and therefore the incident was remembered. The brain of the dog was examined by the Houston City Health Laboratories and was positive for Negri bodies. This information presumably never reached the patient.

COMMENT

According to the records of the Texas State Department of Health,[1] examinations during the year of 1953 were made of the heads of 2,989 dogs (1,075 positive), 859 cats (68 positive), 178 cows (58 positive), 171 foxes (150 positive), 68 skunks (44 positive), 17 raccoons (2 positive), 6 coyotes (1 positive), 3 wolves (3 positive), 7 goats (3 positive), 1 bobcat (positive), and 3 horses (1 positive). In all, 4,302 animals were examined, and the brains of 1,406 were positive for rabies. The brains of 1,378 of these animals were examined for rabies by the Houston City Health Laboratories, and 588 of them were positive.[2] The Texas State Department of Health recorded 34 cases of human rabies during the 11 years 1938 to 1948.[3] In the ensuing five years (1949 to 1953), 10 cases of human rabies were reported in the state of Texas.[1b]

Rabid animals constitute the reservoir for human infection with rabies. The greater the incidence of rabies in animals in a community, the greater the opportunities for human rabies. Thus the control of rabies, both animal and human, depends on the laws and regulations concerning potentially rabid animals and on the enforcement of such laws. Inadequate laws or failures in enforcement lead to outbreaks of rabies in animals and to occasional infection in man. Therefore, in communities where rabies in animals is prevalent, when a patient presents obscure severe nonlocalized central nervous system manifestations that culminate in death, rabies should be considered as a possible cause.

SUMMARY AND CONCLUSIONS

Not all patients who die are examined post mortem, and the brain is not always included in the examination. Whenever there is a suspicion that a patient has had rabies, a search should be made for the characteristic lesions in the brain so that the disease may be identified. This is important because the recorded increased incidence of human rabies in a community focuses attention on its source and leads to enforcement of laws and regulations. This in turn decreases rabies in animals and reduces the chances of transmission to other animals and to man.

2002 Holcombe Blvd. (31) (Dr. Halpert).

1. (*a*) Cox, G. W.: Personal communication to the authors. (*b*) Irons, J. V.: Personal communication to the authors.
2. Wende, R. D.: Personal communication to the authors.
3. Scull, A. J.: Rabies: Community Problem in Texas, Texas State J. Med. **45**: 343-349 (June) 1949.

Isoniazid and Iproniazid.—Isoniazid and iproniazid exert a definite beneficial effect in human tuberculosis symptomatically, pathologically and bacteriologically. The symptomatic effect of iproniazid exceeds by far that of isoniazid and other antimicrobial agents or their combinations now in use. It expresses itself in striking increases of appetite, weight and sense of well being, and in a decrease of pulmonary symptoms. Impressive improvement of pulmonary pathology is essentially limited to cases of exudative and exudate-caseous tuberculosis. The healing effect of either drug alone did not measure up to that of the streptomycin-PAS combination. The roentgenographic results with the isoniazid-streptomycin combination were not superior to those obtained with isoniazid alone, but seemed to be more lasting after therapy was discontinued. Combined isoniazid-streptomycin therapy is not recommended for patients for whom surgical therapy is under consideration: bacterial sensitivity to one drug should be preserved for the postoperative course. Sputum conversion was achieved in over 50 per cent of the patients with combined isoniazid-streptomycin therapy; with isoniazid alone, it was less than half that figure. Iproniazid therapy converted the sputum in over 40 per cent. The development of bacterial resistance to isoniazid cannot be questioned. Detailed information as to the degree and speed of this occurrence could not be obtained from the data which have become available so far. The toxic manifestations of isoniazid were of minor degree; those of iproniazid were numerous, often pronounced, and frequently affected the central nervous system. Neuropsychiatric changes were observed in emotionally labile individuals. Psychosis occurred in 20 per cent of all iproniazid-treated patients. Iproniazid should be approved for the treatment of carefully selected patients in whom pronounced symptoms and a poor physical status require the speediest possible improvement of their general condition. Its administration should be permissible only under constant institutional care.—R. G. Bloch, M.D.; A. S. Dooneief, M.D.; A. S. Buchberg, M.D., and S. Spellman, M.D., The Clinical Effect of Isoniazid and Iproniazid in the Treatment of Pulmonary Tuberculosis, *Annals of Internal Medicine*, May, 1954.

NEGATIVE MASTER TESTS IN THE PRODROMAL STAGE OF ACUTE MYOCARDIAL INFARCTION

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The increasing use of routine electrocardiograms in clinical and industrial medicine and the physician's awareness of the existence of coronary disease has resulted in the recognition of a prodromal stage or "incubation" period for acute myocardial infarction—a period that may last as long as several weeks and during which time no test may give objective evidence of coronary disease or presage the inevitable infarction to come.

Gilson and Day [1] have suggested the term latent myocardial infarction to describe this period. Their five cases, however, all showed ischemic patterns prior to the infarction, and they believed that these cases might fall within the classification of coronary failure so well described by Freedberg and others.[2] Hecht [3] stated that uniform ischemia of all muscle layers or ischemia localized to an intramural area surrounded by well-functioning muscle may give no electrocardiographic changes. It is a well-recognized fact that the electrocardiogram may be quite normal in the presence of severe coronary atherosclerosis and that myocardial changes (tissue death, injury, or ischemia) are required to produce an abnormal pattern.[4] Likewise, various tests designed to increase the demand on coronary flow (inhalation of 10% oxygen, Master two-step test, or various degrees of uncalibrated exercise) may fail to give positive results in as high as 50% of the patients with known coronary atherosclerosis. That such provocative tests may sometimes be negative in the prodromal stage of infarction should be emphasized in order that physicians avoid accepting the result as entirely ruling out its possibility. As Feil [5] pointed out, a normal record should not rule out a developing coronary thrombosis, and this statement may be amplified to include negative stress tests.

Our six patients were observed for the past two years, and all were hospitalized for investigation of chest pain that was not entirely typical of either the anginal syndrome, coronary insufficiency, or acute myocardial infarction. Studies included roentgenograms of the cervicodorsal spine, esophagograms with gastrointestinal roentgenograms, cholecystograms, and Master two-step tests. These gave negative findings as did the usual hematological studies for inflammatory disease. The following case has been selected as typical of the syndrome.

REPORT OF A CASE

A 42-year-old white man was admitted to the Delaware Hospital Aug. 20, 1952, on the service of Dr. Walter S. Lumley. For one month, the patient had experienced substernal pain while walking home from work with relief obtained by "slowing up." Four days prior to admission, he experienced substernal pain with bilateral arm radiation while shoveling cement; this lasted three hours, and only equivocal relief was obtained with the use of glyceryl trinitrate (nitroglycerin).

Past History.—One and one-half years before admission, the patient had experienced an attack of substernal pain that lasted intermittently for two days and was associated with exertion. In February, 1952, a senile cataract was removed at the same hospital, and at this time, a random blood pressure reading of 160/90 mm. Hg was recorded. He recalled that a physician had found "high blood pressure" 10 years previously. No electrocardiograms were taken prior to the present admission.

Physical Examination.—Examination showed a restless, mesomorphic man complaining of substernal burning. He was unable to remain quiet, and his behavior frequently suggested an acute anxiety state. A lens opacity was present in the right eye, the left lens was absent, and the heart sounds were normal without arrhythmia. A few sibilant rales were detected in the left base. The remainder of the physical examination showed no abnormalities. Blood pressure, checked every three hours, ranged from 200/140 mm. Hg to 130/70 mm. Hg.

Phenobarbital and chloral hydrate were used in an attempt to control the restlessness. Glyceryl trinitrate, amyl nitrite perles, and meperidine (Demerol) gave such equivocal relief for the pain that placebo therapy was tried by the medical resident. Finally, morphine sulphate, one-half grain every four hours, was necessary to relieve the patient's distress.

On Aug. 21, the laboratory reports revealed the following: hemoglobin value 17 gm. per 100 cc., leukocyte count 8,800 per cubic millimeter, and differential count 72 neutrophils with 20 nonsegmented forms, 26 lymphocytes, and 2 monocytes. The blood cholesterol level was 284 mg. per 100 cc., the fasting blood sugar level was 98 mg. per 100 cc., and the Mazzini test showed normal results. Roentgenograms of the chest and cervicodorsal spine were reported as normal.

Diffuse chest pain continued to increase and decrease in a manner well described by Steincrohn,[6] who believed this to be a new sign of early coronary thrombosis. On Aug. 21, both resting and exercise tracings were made (see figure) and they showed no changes diagnostic of coronary disease. The Master two-step tracing showed a slight depression of 0.5 mm. in V_4. No apparent increase in the pain or change in clinical status could be detected after the test, and it was decided to observe the patient over the weekend and to continue to relieve the pain and anxiety with appropriate drugs.

On Aug. 21, the patient appeared much more comfortable, and a tracing taken on that day showed a typical pattern of acute posterior infarction. As pointed out by Gilson and Day,[1] the development of the typical QT infarction pattern is often accompanied by dramatic relief, suggesting that the ischemic rather than the necrotic area is responsible for pain. The patient's blood pressure soon stabilized at 130/70 mm. Hg, and the remaining tracings showed the expected changes of a recent posterior infarction. A sedimentation rate was reported on Aug. 25 as 20 mm. in 60 minutes, increasing to 23 mm. in 60 minutes four days later. Convalescence was uneventful, and the patient was discharged Aug. 29. Follow-up study indicates the patient is on full employment status and without symptoms.

From the departments of cardiology, Delaware and Memorial hospitals.

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2. Freedberg, A. S.; Blumgart, H. L.; Zoll, P. M., and Schlesinger, M. J.: Coronary Failure: Clinical Syndrome of Cardiac Pain Intermediate Between Angina Pectoris and Acute Myocardial Infarction, J. A. M. A. **138**: 107-114 (Sept. 11) 1948.

3. Hecht, H. H.: Concepts of Myocardial Ischemia, Arch. Int. Med. **84**: 711-729 (Nov.) 1949.

4. Bayley, R. H.; LaDue, J. S., and York, D. J.: Electrocardiographic Changes (Local Ventricular Ischemia and Injury) Produced in Dog by Temporary Occlusion of Coronary Artery, Showing New Stage in Evolution of Myocardial Infarction, Am. Heart J. **27**: 164-169 (Feb.) 1944.

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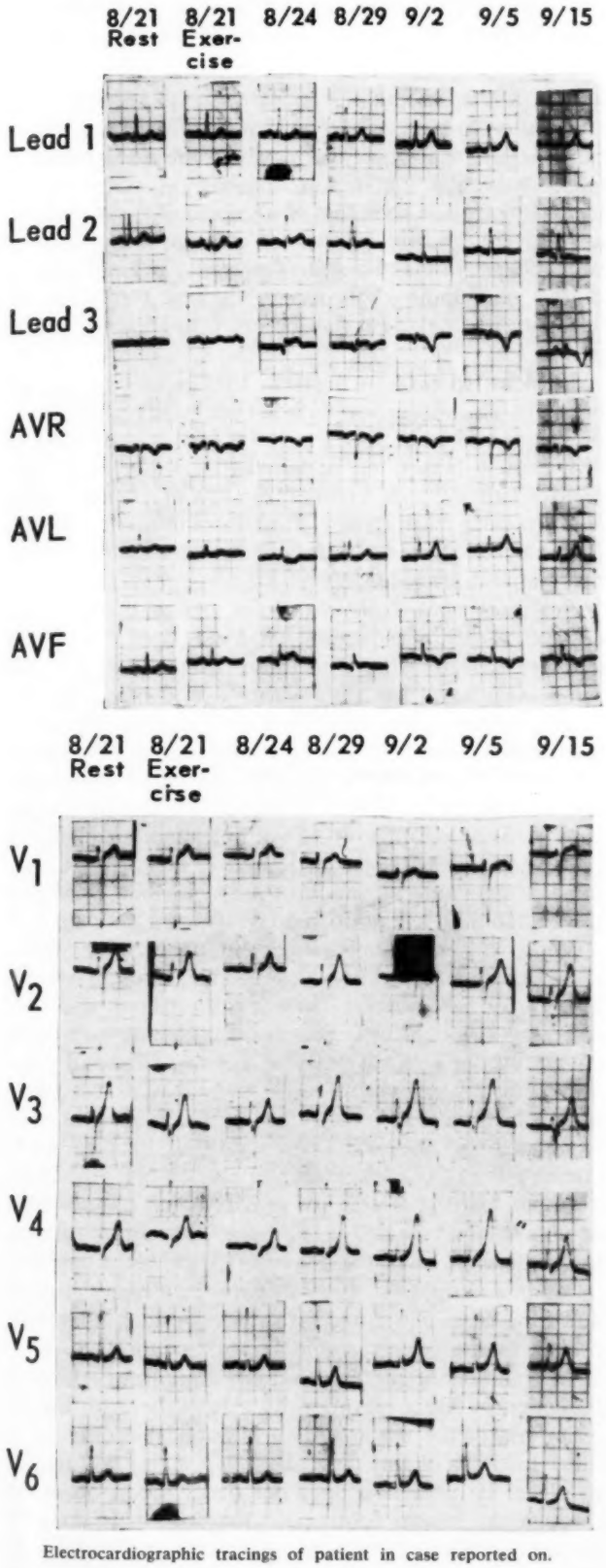
COMMENT

In reviewing the events, one is obviously impressed by the symptoms of angina and coronary insufficiency



Electrocardiographic tracings of patient in case reported on.

persisting for one month but showing no changes by resting and exercise tracings. The only suggestive finding in the laboratory studies was the moderate shift to the left in the leukocyte count, which seemed to foreshadow the development of some acute inflammatory process.

In the patients observed, the employment of the Master two-step test did not seem to aggravate the clinical status and did not appear to precipitate the final end result. I do not mean to imply, however, that such a test should be considered harmless; certainly good clinical judgment would proscribe placing any added strain on the coronary circulation during this period. Nevertheless, an exercise tracing will occasionally be done inadvertently, before the true state of affairs is recognized. If such is the case—and a negative tracing results—observation should be prolonged for a sufficient period in order to exclude the existence of this prodromal stage. In this connection, one of the observed patients was discharged shortly after the completion of the studies, only to die one week later of an acute myocardial infarction at home.

The value of long-term anticoagulant therapy in these persons suspected of being in the prodromal stage of myocardial infarction has not yet been determined. My own observations plus reports in the literature have not definitely shown that anticoagulant therapy will prevent the seemingly inevitable infarction to come. Further study in this direction is needed.

SUMMARY

The recognition of a prodromal or latent stage of myocardial infarction of undetermined duration (weeks or months) separate from the anginal syndrome and from acute coronary insufficiency is extremely necessary. Further study should be directed to determining ways and means for diagnosis and management of this period and whether any specific therapy will prevent, delay, or ameliorate the acute attack.

623 Delaware Ave.

Atelectasis in Post-Traumatic Paralyzed Patients.—In paralyzed states, in view of the preceding histories, there is definite indication for chest x-ray examination at the first signs of an upper respiratory infection. . . . The roentgen signs of atelectasis may be minimal and the diagnosis has to be kept in mind. These patients, due to their condition, usually have had previous x-rays, and the comparison studies make the diagnosis of atelectasis more readily apparent. Further, follow-up studies seem advisable if the infection does not respond to routine therapy, for, in the presence of atelcetasis, more adequate medication is indicated to avoid the further complications of infection and atelectasis, such as pneumonia, abscess formation and fibrosis. The therapy routine in these cases . . . consisted of adequate antibiotics, ammonium chloride, aminophylline, and oxygen when indicated. . . . Along with the indicated medications, it is most important that the patient have careful nursing, consisting of frequent changing of position and encouraging of cough. . . . Temperature elevations are very common in paraplegic and quadriplegic patients. Pyrexia is most usually caused by exacerbation of urinary tract infection, which is ever present, and formation of decubitus ulcerations. But, in the presence of an upper respiratory infection atelectasis as a cause of the temperature rise must be considered. It can be readily demonstrated by x-ray examination, and the other causes of fever in post-traumatic paralyzed states can be readily differentiated.—R. L. Friedman, M.D., Atelectasis in Upper Respiratory Infections in Post-Traumatic Paralyzed Patients, *Annals of Internal Medicine,* May, 1954.

INTERNAL WIRE PIN FIXATION IN COMPLICATED FRACTURES OF JAW AND FACIAL BONES

James Barrett Brown, M.D.
and
Minot P. Fryer, M.D., St. Louis

Internal wire pin fixation of a severe facial fracture at the time of the primary repair is an important procedure in efforts to avoid the use of complicated external appliances and to at least keep to a minimum the necessity for secondary reconstructive procedures. As a fundamental rule facial wounds should be closed as soon as possible to avoid infection and fibrosis and permanent fixation out of position of small bone fragments and to align soft tissue features before distortion and shrinkage.

Soft tissue lacerations and tears are accurately closed with deep fixation sutures and with small sutures placed close to the edge of the wound after adequate cleansing and débridement. Any possibly viable tissue is never cut away. Known points are approximated, and, when none are apparent, the wound is closed at the center, and repeated bisection of the open area is done with sutures; the wound is not closed from one end to the other. Avulsed areas of the face, with loss of substance, may be partially closed, distortion of features being avoided, and accurate notes being made for future restoration. In such wounds, internal pins are especially helpful in maintaining the position of fragments that otherwise would collapse.

The time for repair of soft parts and underlying bony support of the face is as soon as the patient's general condition permits. It is almost impossible accurately to reduce displaced, comminuted fragments of bone later than two weeks after injury. Facial wounds are not packed open. Either local block or general intratracheal anesthesia may be used.

The alignment of the fragments is necessary before the wire pin stabilization is done, or the fragments would be fixed out of position. Unless proper alignment can be secured, the pins are used only for temporary fixation and later alignment.

In the lower jaw, internal wire pin stabilization following reduction is done with a 0.05 to 0.08 in. (0.13 to 0.2 cm.) Kirschner wire (or plain stainless steel with a bayonet point ground on it) driven across the fracture site and below the nerve canal by means of a power drill (fig. 1). Interdental wiring is usually the simplest method of holding a fractured mandible in reduction, if teeth are present in all fragments. An internal wire can be of help in this instance, however, if there is comminution of the bone, compounding into the mouth, or delay in treatment or if the injury is in an area where delayed union is not infrequent, as at the symphysis, and gives added planes of fixation. In the edentulous mandible, or in cases of fractures behind available teeth near the angle of the jaw, the use of the internal wire is the simplest method of fixation and may be combined with other methods such as circumferential wiring and wiring of teeth. If there has been loss of a section of the mandible, as in severe crushing injuries, an internal wire may prevent collapse of the remaining fragments and contracture of the surrounding soft tissue, thereby obviating the necessity for making a flap before a bone graft can be done.

In older fractures, or in those that cannot be aligned properly, elastic traction with rubber bands across fracture lines and from upper to lower jaw may be used, if firm enough hooks can be wired to the displaced fragments. This depends on the presence of enough stable teeth in each fragment. In these instances, after elastic traction has aligned the fragments, internal wire pins may be used if needed.

Fractures of the upper alveolar arch and palate can be said to be in reduction when the upper teeth are in correct relationship with those of the lower jaw, the same as in any fracture of either dental arch (fig. 2). In this instance, the upper jaw can be immobilized by interdental wires, with the lower jaw used as a splint for the upper. An arch of twisted no. 24 or 26 steel wires anchored to the back teeth on each side and then brought together in front may give fixation in another plane, or the various arch wires with hooks on them may be applied. If adequate alignment can be obtained, wire pins driven from a solid into a loose portion of palate or alveolus will give supplementary immobilization. When these other methods are not applicable, as in an edentulous upper jaw, internal wire fixation alone will give sufficient immobilization for solid union. If both sides of the alveolar arch or palate are loose, any solid point above, as the zygoma on either side, may be used as a point of stability in which to originate an internal wire. If no point in the vicinity is stable, as in a complete crushing injury of the middle third of the face, the internal wire binds the loose fragments together and lends enough stability in itself for union. This is of great advantage in fixing the fragments and allowing better manipulation and suturing of the soft parts in a badly crushed and torn face. The immediate result of such fixation is often remarkable in restored stability of the face.

In fractures about the orbit, the simplest method of reduction is direct elevation by a hook beneath the inferior rim of the zygoma. This is applicable only, as in other methods of this type, if the fragments will impact in place. If impaction does not occur, open operation through the buccal fornix into the antrum is done by elevating the larger fragments of zygoma and bimanually molding the displaced smaller sections of orbital floor and antral wall into place. No fragment of bone is discarded when repairing injuries anywhere in the face or nose, unless it is completely detached. These commi-

From the Department of Surgery, Plastic Surgery Service, Washington University School of Medicine.
Read at the Seventh Clinical Meeting of the American Medical Association, St. Louis, Dec. 2, 1953.

nuted parts are held in place with an iodoform balsam of Peru pack lightly folded into the antrum. Direct wiring of the ascending ramus of the zygoma to the frontal bone is sometimes needed. Occasionally, an approach to a depressed zygomatic arch may be made from the temporal region.

When the opposite sound zygoma is used as a point of fixation, an internal wire can help to hold a fractured and displaced zygoma by cantilever action after elevation and alignment of the loose zygoma has been accomplished by manipulation through the antrum or mouth or by means of an external hook through the face and under the border of the zygoma.

In extensive crushing injuries of the middle third of the face, the internal wire pin may give surprising help in fixation, since it tends to stabilize and hold firmly loose parts on both sides. In bilateral fracture dislocation of the zygoma and the necessary comminution of all its attachments, reduction of the larger fragments and fixation by an internal wire driven across the face may give a foundation on which to base the fixation of the displaced surrounding smaller parts. In even the more hopeless crushing injuries, with this as a start, features can be restored from comminuted fragments "mulched" and molded around packs in both antra and the nose.

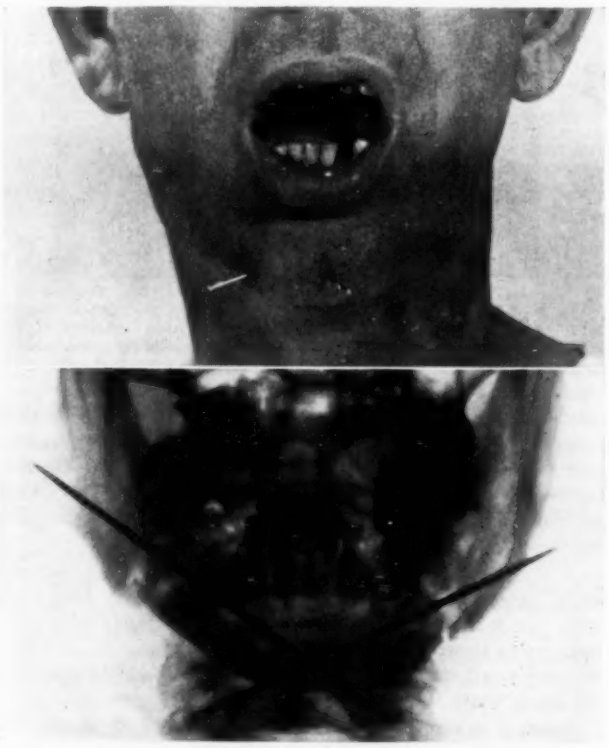


Fig. 1.—Wire pins stabilizing loose central portion of mandible in bilateral fracture of mandible. The patient was able to eat solid food throughout period of fixation. The jaw healed solidly, and the wire pins were removed two months after injury.

In cases of associated transverse facial fractures, after the zygomas have been reduced and stabilized with an internal wire pin as described above, this pin can then be used as a new point of fixation, because it will hold another wire pin driven through the reduced upper alveolus. Both of these wire pins are driven into a small wooden block on each side of the face, or an adjustable external bar used between them, or no. 26 stainless steel wires can be twisted between the wire pins beneath the soft tissue of the face.

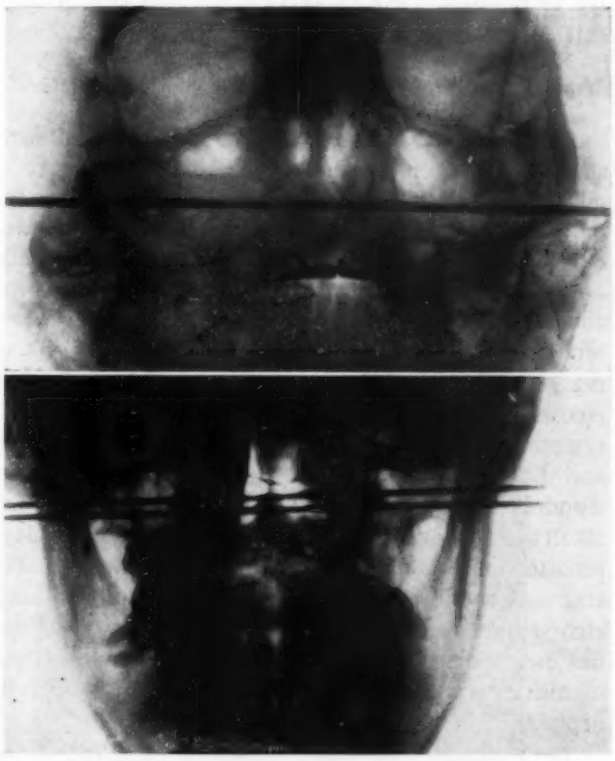


Fig. 2.—Roentgenogram of wire pins in face stabilizing loose fragments of upper jaw.

SUMMARY AND CONCLUSIONS

Complicated and expensive overhead and external appliances usually may be avoided in fractures of the jaws and facial bones. The use of internal wire pins is an additional method of stabilization in such fractures and is of value even in severe crushing injuries of the face.

400 Metropolitan Bldg. (3) (Dr. Brown).

Treatment of Penicillin Reactions.—Pronestyl is not the final answer to treatment of penicillin reactions, but . . . [it is] at least as good as and probably better than Benadryl for this purpose. In severe reactions cortisone or ACTH may be indicated, especially in light of reports of anaphylaxis and death from severe penicillin reactions. Such cases are unusual, however, and it is felt that these powerful metabolic drugs are unnecessary in average cases. Pronestyl will afford rapid relief of symptoms in many of these cases. . . . [It] is relatively nontoxic, although . . . one case of allergy to this drug itself has been reported. Some care must be taken in patients with heart disease because of the possibility of the development of heart block. We noted no untoward effects in our patients except for mild transient dizziness in one patient, anorexia in another, and insomnia in a third. Electrocardiograms taken after two or three weeks on Pronestyl therapy showed no significant abnormalities, and there was no evidence of agranulocytosis or other hematologic disorder. It is . . . felt that this drug has a place in the treatment of allergic reactions to penicillin and deserves further clinical evaluation.—P. B. Jennings, M.D., and S. Olansky, M.D., The Use of Procaine Amide in the Treatment and Prevention of Penicillin Reactions, *Annals of Internal Medicine*, April, 1954.

CLINICAL NOTES

REVERSIBLE METASTATIC CALCIFICATION (MILK DRINKER'S SYNDROME)

Murray Dworetzky, M.D., New York

Burnett and co-workers,[1] in 1949, first reported metastatic calcification associated with excessive intake of milk and alkali in patients with chronic peptic ulcer and renal insufficiency. While all of their six patients showed clinical improvement when milk and alkali were withdrawn from the diet, none showed resorption of the calcinosis and none survived. Since that time a case has been reported with clinical improvement and survival following gastrectomy for the peptic ulcer, although the calcinosis persisted.[2] Another case was presented with acute symptoms resembling gout in which both the symptoms and the calcinosis decreased when milk and alkali were withdrawn but recurred when the former high milk and alkali diet [3] was resumed. Wermer, Kuschner, and Riley [4] reported an instance of disappearance of extensive skeletal and subcutaneous metastatic calcifications within eight months after milk and alkali were removed from the diet. Their patient, a 67-year-old man, died four months later of renal failure due to chronic glomerulonephritis.

The following case is being reported because it represents an example of this syndrome, in which remarkable disappearance of the calcinosis followed the institution of restricted intake of milk and alkali and the administration of aluminum hydroxide gel. After two and one-half years' observation, the patient is active and appears to be in good health.

REPORT OF A CASE

A 50-year-old writer was first seen on May 31, 1951, with the chief complaint of abdominal pains of six weeks' duration. He had had typical symptoms of duodenal ulcer beginning in the spring of 1923 and recurring every spring and fall for periods of about three or four weeks until 1934, when the diagnosis was confirmed by a roentgenogram. He was treated with Sippy diet and powders, each containing approximately 0.65 gm. of calcium carbonate and 2.0 gm. of sodium bicarbonate, and in addition he drank a quart (one liter) of milk or more daily with improvement. In 1941, because of frequent sour eructations associated with periods of tension, he increased his intake of milk and took 12 to 20 doses of powder a day.

Between 1943 and 1948 the patient had four episodes of renal colic. On one of these occasions he passed a stone, which was not analyzed. Early in 1948 the patient had a return of ulcer symptoms, and a roentgenogram was said to show a crater in the duodenal cap. He increased his intake of milk to six to eight quarts (six to eight liters) a day and continued the dosage of the powders as before.

In October, 1948, 14 years after the diet and powder therapy was instituted, severe pain and stiffness in the right shoulder caused the patient to enter the hospital. At the time of admission his blood pressure was 210 mm. Hg, possibly caused in part by marked nervousness, since during the one month of hospitalization it returned to normal. A moderate anemia was treated with iron. In August, 1949, while under marked physical and emotional tension, he had a sudden episode of weakness and was hospitalized for three weeks. There he was said to have had severe anemia and pyuria, and it was believed that he had had a urinary infection in addition to a hemorrhage from the duodenal ulcer. A roentgenogram showed a duodenal ulcer with a crater, plus old scarring in the duodenal cap. He received three blood transfusions during his hospitalization. Recurrent flareups of ulcer symptoms continued and in May, 1950, he was again hospitalized because of a marked anemia requiring a transfusion.

In December, 1950, because of the development of pain and stiffness of his shoulders, roentgenograms were made, and the patient was found to have extensive calcium deposits. These were treated by aspiration, heat, and massage, and he was advised to discontinue the use of the Sippy powders but was allowed to continue intake of milk as high as three or four quarts a day. He continued to have severe pains in both shoulders up to the time I first saw him. About April, 1951, recurrence of ulcer pains followed a marked increase in nervous tension associated with a new job. In addition, and for the first time, he noted postprandial gastric bloating, occurring 10 minutes after meals and sometimes relieved by voluntary or involuntary vomiting.

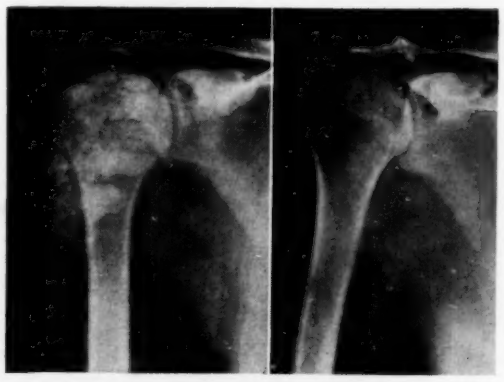


Fig. 1.—On the left, roentgenogram of the right shoulder in January, 1951, showing calcium deposits. On the right, roentgenogram of right shoulder in March, 1953, showing almost complete disappearance of calcium deposits.

A review of the patient's systems was otherwise noncontributory except that since 1950 he had had pain in both calves with fast walking for three to four blocks, relieved in a few minutes by slowing down or stopping. This symptom was worse in cold weather. There had been nocturia four to five times for many years.

Physical examination showed a well-developed, fairly well-nourished man with the following pertinent findings: temperature normal, pulse rate 72 beats per minute, blood pressure 118 mm. Hg systolic and 80 diastolic, height 65 in. (165 cm.), and weight 152 lb. (69 kg.). There was grade 1 sclerosis and no narrowing of the vessels of the fundus. The teeth were markedly carious. The lower incisors were loose, and the upper teeth were missing. There was marked periarticular swelling around the right shoulder with limitation of motion. Rectal examination showed small external hemorrhoids. The prostate gland was slightly enlarged. On fluoroscopic examination the lung fields were clear with the heart in the horizontal position and at the outer limits of normal size. Fluoroscopic examina-

From the Department of Medicine, Cornell University Medical College.

1. Burnett, C. H.; Commons, R. R.; Albright, F., and Howard, J. E.: Hypercalcemia Without Hypercalcuria or Hypophosphatemia, Calcinosis and Renal Insufficiency, New England J. Med. **240**: 787-794 (May 19) 1949.

2. Miller, J. M.; Freeman, I., and Heath, W. H.: Calcinosis Due to Treatment of Duodenal Ulcer, J. A. M. A. **148**: 198-199 (Jan. 19) 1952.

3. McQueen, E. G.: "Milk Poisoning" and "Calcium Gout," Lancet **2**: 67-69 (July 12) 1952.

4. Wermer, P.; Kuschner, M., and Riley, E. A.: Reversible Metastatic Calcification Associated with Excessive Milk and Alkali Intake, Am. J. Med. **14**: 108-115 (Jan.) 1953.

tion of the shoulders, elbows, and wrists confirmed the findings in the roentgenograms.

Review of the films taken in December, 1950, and January, 1951, of the shoulders, elbows, wrists, feet, neck, and abdomen showed normal mineralization of all the osseous structures. There was massive soft tissue calcification about the right shoulder (fig. 1, left), small calcific deposits in the soft tissues adjacent to the greater tuberosity of the left humerus, soft tissue calcification along the volar aspect of the right wrist (fig. 2, left), and small calcific deposits adjacent to the third and fourth proximal interphalangeal joint of the right foot and the third proximal interphalangeal joint of the left foot. In addition there was extensive calcification of the abdominal aorta and iliac vessels and a small renal calculus in the right pelvis.

The initial impression was (1) chronic reactivated duodenal ulcer with posterior penetration and possible partial pyloric obstruction and (2) metastatic calcification with renal stones due to excessive milk and alkali intake in the presence of impaired renal function. Hospitalization and further laboratory investigative procedures were refused by the patient against the physician's advice. The patient was told to limit his milk intake to less than a pint (473 cc.) a day, and in addition was urged to take an aluminum gel preparation (Gelusil) in tablet form, 12 to 20 tablets each day before and after meals.

The patient was not seen again for almost two years. On March 11, 1952, he came to the office because of painless gross hematuria. There was no costovertebral angle tenderness. The urine was grossly bloody and packed with red blood cells on microscopic examination; the specific gravity was 1.005, there was a slight trace of albumin, and there was no sugar in the urine. A blood cell count and differential examination were within normal limits.

Because of urgent business the patient delayed hospitalization until March 14, 1953, despite the persistence of gross hematuria and the development of renal colic, the latter beginning 24 hours before admission. He was in no acute distress. The pulse rate was 72 beats per minute, temperature 98.6 F, and blood pressure 122/76 mm. Hg. Physical findings were unchanged from the examination two years previously except that the abdomen was tense and moderately distended but nontender, and there was full range of motion of all the joints, including the right shoulder, without the periarticular swelling that was so conspicuous two years previously.

The day following admission the patient had a temperature of 101.5 F associated with generalized aches and pains and fairly marked right costovertebral angle tenderness. On March 16, after urinary cultures were obtained, penicillin therapy was started, 400,000 units intramuscularly every day. The following day an intravenous pyelogram showed a calculus lodged in the upper end of the right ureter. In addition two small calculi were seen in the mid one-third of the right kidney. A cystoscopic examination was made by Dr. Alphonse Davalos, and the right ureter was catheterized. The stone previously described was pushed upward into the pelvis. This was followed by a copious return of blood and mucopurulent material. A pyelogram on the right side showed, in addition to the stone, a stricture at the site where the calculus had been lodged, minimal right hydronephrosis, and irregular and blunted calices. By March 17, the temperature had returned to normal. The following day the patient was operated on by Dr. Davalos; a small, light brown, hard, irregular calculus was removed from the right renal pelvis. On chemical analysis the calculus was found to contain calcium phosphate, calcium carbonate, and ammonium phosphate. The patient made an uneventful postoperative recovery.

Laboratory examinations during the period of hospitalization showed the following pertinent findings. On March 14 the hemoglobin level was 14.0 gm. per 100 cc., red blood cell count 4,900,000, hematocrit 44%, and white blood cell count 15,300 with lymphocytes 14%, monocytes 2%, eosinophils 1%, mature polymorphonuclear cells 73%, and immature cells 10%. Urinalysis on March 14 showed normal results. The hematuria had cleared up prior to this examination. The Sulkowitch test on the urine showed calcium 1+. The stool guaiac tests for occult blood were negative. Urine culture before penicillin was given showed Staphylococcus albus and Corynebacterium diphtheroides. Urine culture from ureteral catheterization on March 17 (after 48 hours of penicillin treatment) was negative. A 24 hour urine chemistry study was performed the day before discharge from the hospital on March 29. There was a volume of 2,000 cc., creatinine 1.2 gm., calcium 0.07 gm., and phosphorus 0.605 gm.

Blood chemistry studies showed the following findings: Six serum calcium values ranged from 9.0 to 9.9 mg. per 100 cc. except for one of 7.2 mg., which was thought to be a laboratory error. Four serum phosphorus determinations ranged from 3.5 to 4.6 mg. per 100 cc., while the product of the amounts of calcium and phosphorus ranged from 31.5 to 45.5 mg. per 100 cc. Two alkaline phosphatase determinations were 4.5 and 5.2 units per 100 cc. (Bodansky). Blood urea nitrogen values ranged from 57 to 35 mg. per 100 cc.; they were lowest at the time of discharge from the hospital. Serum carbon dioxide ranged from 23 to 20 mEq. per liter. Urea clearance on the last hospital day was 24.3% of normal in the first hour and

Fig. 2.—On the left, roentgenogram of the right wrist in January, 1951, showing calcium deposit. On the right, roentgenogram of same wrist in March, 1953, showing a complete disappearance of calcium deposit.

22.0% in the second hour. Further studies showed the serum sodium to be 140 mEq. per liter, potassium 4.8 mEq. per liter, chloride 104 mEq. per liter, cholesterol 206 mg. per 100 cc., and blood albumin-globulin ratio 4.8/2.0 gm. per 100 cc.

The electrocardiogram was essentially normal. Roentgenograms of both shoulders, elbows, and wrists compared with the films taken 27 months previously showed that the massive calcification in the soft tissues of the right shoulder was almost completely absorbed and the very large amorphous deposit outlining the subdeltoid bursa had disappeared, with only a small residual calcific deposit in the region of the coracoclavicular ligament (fig. 1, right). In addition there was considerable clearing or complete disappearance of calcium from all sites formerly involved except for the calcification of the abdominal aorta and iliac arteries. The degree of calcification graded from 0 to ++++ was corroborated by an independent observer,[5] and the change in calcification from January, 1951, to March, 1953 is shown in the table.

A plane film of the abdomen on March 25 showed several small calcific deposits in the right kidney. The large stone seen

5. Dr. John A. Evans, Department of Radiology, Cornell University Medical College made the observations.

before surgery was no longer present. An excretory urogram on March 27 postoperatively showed prompt functioning bilaterally. There was very poor anatomic detail of the structures. There was a faint suggestion of some caliectasis, especially on the left side. A gastrointestinal series showed a defective duodenal bulb, interpreted as a duodenal ulcer with no evidence of activity. There was good emptying in one hour.

After the amazing absorption of calcium was noted, the patient was questioned further. He then gave the information that about July or August, 1951, or within a month or two after he had stopped taking the large amounts of milk and had been given the albumin hydroxide gel, he noted gradually increasing ability to move the shoulder and loss of pain and stiffness. This continued to improve over the ensuing months, and in the past several months before hospitalization he had been asymptomatic in regard to shoulder pain. The intermittent claudication had not reappeared, although he had not extended himself sufficiently to produce pain within the past two years.

The patient was seen in eye consultation by Dr. Richard Troutman, who found that the external and slit lamp examinations showed small whitish deposits in the palpebral fissures, both mesial and distal to the cornea with a faint, white, peripheral ring about both corneas. The material in these areas could not definitely be labeled calcium; however, there was every indication that a larger quantity had existed in the past and that a very minimal quantity now remained together with the scarring from the absorptive process of the previous deposits.

Evidence of Calcinosis Graded from Zero to ++++ in Severity, Before and After Dietary Restriction

	Jan., 1951	March, 1953
Skull	..	±
Neck	0	..
Shoulder		
Right	++++	±
Left	+	±
Elbow		
Right	+	0
Left	..	0
Wrist		
Right	++	0
Left	..	0
Feet		
Right	+	..
Left	±	..
Abdominal aorta and iliac arteries	+++	+++

The patient was discharged from the hospital feeling well on March 31, 1953, on the 17th hospital day and on the 13th postoperative day. He was given a low calcium, moderately low phosphorus diet and aluminum hydroxide gel, four tablets four times daily.

On April 14, 1953, painless gross hematuria developed with low grade fever that subsided in five days. On cystoscopy, the blood was found to be coming from the right ureteral orifice. It was felt that possibly the patient had passed a small stone. Because it was believed that he was not following his diet closely, his dose of aluminum hydroxide gel was increased to eight tablets four times daily. A twenty-four hour urine study on May 25 showed calcium to be 0.046 gm. and phosphorus 0.655 gm., not significantly different from the results in March. When last seen on Sept. 28, 1953, the patient looked and felt in generally good health and had had no further incapacitation.

The final impression was inactive duodenal ulcer, with metastatic calcinosis associated with excessive milk and alkali intake (milk drinker's syndrome) with reversal of calcification after removal of excessive milk and alkali and administration of aluminum hydroxide gel. In addition there was impaired renal function, probably secondary to chronic bilateral pyelonephritis in association with long-standing hypercalcemia and renal calculi.

COMMENT

This patient represents an example of metastatic calcinosis occurring in persons with chronic peptic ulcer who have long-standing high intakes of milk and alkali. This has been called quite appropriately milk drinker's syndrome. Although unfortunately the patient refused blood chemistry studies before milk and alkali were removed from his diet, previous reports have demonstrated hypercalcemia without hypophosphatemia or hypercalcuria.[6] This results from the associated renal insufficiency present in all cases thus far reported; the poorly functioning kidney is unable to excrete these large amounts of calcium and phosphorus. While the role of associated alkali intake has not yet been definitely established, all previously reported patients have taken alkali in addition to milk, and studies have reported the damaging effect of alkalosis on renal function.[7]

It should be stressed in the present case that the patient's dietary change consisted of a reduction of the calcium and phosphorus intake to approximately normal, and no attempt was made prior to the disappearance of the calcification to restrict these elements further other than to give him aluminum hydroxide gel, both as a substitute for alkali and in hopes of decreasing the intestinal absorption of phosphorus.[8] The 24 hour urine studies for calcium and phosphorus on two occasions furnished no evidence of any marked reduction of urinary calcium and phosphorus. In addition, between the two urine studies on March 29, 1953, and May 25, 1953, there was no significant difference in the urinary calcium and phosphorus despite an apparently unsuccessful attempt in the interim to further limit absorption by decreasing intake of these elements and by increasing the dose of aluminum hydroxide gel. Thus it is reasonable to assume that in this case no more than a return to normal diet and removal of the alkali resulted in resorption of the soft tissue calcium deposits. The calcification of the aorta and common iliac arteries, however, were unchanged.

SUMMARY

In a case of metastatic calcinosis secondary to prolonged intake of milk and alkali because of chronic duodenal ulcer, remarkable disappearance of the calcinosis followed elimination of the excessive intake of milk and substitution of an aluminum hydroxide gel for the alkali. The patient is well two and one-half years after the beginning of the management, though underlying renal insufficiency persists.

50 E. 78th St.

6. Burnett and others. Miller and others.[2] McQueen.[3] Wermer and others.[4]

7. Kirsner, J. B., and Palmer, W. L.: Alkalosis Complicating Sippy Treatment of Peptic Ulcer, Arch. Int. Med. **69**: 789-807 (May) 1942. Burnett, C. H.; Burrows, B. A., and Commons, R. R.: Studies of Alkalosis: Renal Function During and Following Alkalosis Resulting from Pyloric Obstruction, J. Clin. Invest. **29**: 169-174 (Feb.) 1950.

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BLEEDING PEPTIC ULCER COMPLICATING HYDRALAZINE AND HEXAMETHONIUM BROMIDE THERAPY

Harry Mandelbaum, M.D.
Jack Brook, M.D.
and
Robert A. Mandelbaum, M.D., Brooklyn

In a recent paper discussing the treatment of hypertension, Wilkins [1] refers to two patients who suffered large gastrointestinal hemorrhages while taking hydralazine. The increasing popularity of the newer drugs used in the treatment of hypertension, despite many reports of serious toxic actions and many side-effects, prompted this report of an instance of melena as the first indication of bleeding from a peptic ulcer in a patient under treatment with hydralazine and hexamethonium bromide.

REPORT OF A CASE

A 40-year-old man was admitted to the Jewish Hospital for treatment of hypertension. At the age of 20, he had been told that he had mild hypertension. In 1946, he passed a kidney stone; subsequent cystoscopy and retrograde pyelograms showed no abnormalities. His mother has been suffering from hypertension since her menopause. During the past seven years, headache has occurred in the patient once or twice weekly and has been relieved by the administration of phenobarbital. For four weeks prior to admission to the hospital, he had serious business worries. In the latter two weeks, the headaches increased in severity and were not relieved by the administration of phenobarbital. His doctor noted progressive rise in the blood pressure and referred him to the hospital for study and treatment.

The physical examination showed a short, well-built man weighing 164 lb. (73 kg.). The blood pressure was 220/130 mm. Hg in both upper extremities and 290/150 mm. Hg over the left popliteal fossa. The pulse rate ranged from 72 to 110 beats per minute, and the temperature was normal. The eye grounds showed marked arteriovenous nicking, scattered areas of exudate and tiny hemorrhages, and blurring of the disks. The pupils were equal in size. A neurological examination showed no abnormalities. The heart was not enlarged. Grade 1 apical and aortic systolic murmurs were heard, and the aortic second sound was increased. The lungs were clear. The liver, spleen, and kidneys were not palpable.

An electrocardiogram showed left ventricular hypertrophy and left ventricular "strain" pattern. The ballistocardiogram (fig. 1*A* and *B*) showed short or absent I waves at rest and after light exercise; tachycardia was present. The teleroentgenogram showed some widening of the transverse diameter of the heart, particularly of the left ventricular border, with some coiling of the aortic arch. The venous pressure was 131 mm. H_2O and it rose to 141 mm. H_2O with the Valsalva maneuver and on pressure over the right upper quadrant. An intravenous pyelogram showed no abnormalities.

Tests with piperoxan (Benodaine) hydrochloride, 2 mg., and phentolamine methansulfonate (Regitine), 5 mg., gave no indication of the presence of a pheochromocytoma. The urine showed a trace of albumin; the specific gravity ranged from 1.002 to 1.016 on the dilution-concentration test. The blood cell count was normal; the hemoglobin value was 15.1 gm. (Sahli method); the red blood corpuscle count was 4,780,000 per cubic millimeter; the white blood corpuscle count was 9,500 per cubic millimeter; and the differential count and platelet count were normal. The clotting time was four minutes, and the bleeding time was two and one-half minutes. The hematocrit was 49%. The erythrocyte sedimentation rate was 10.9 mm. at the end of one hour, by the Westergren method. The prothrombin time was 10.9 seconds; the control was 9.8 seconds. The Mazzini test showed normal results. The fasting blood sugar level was 78 mg. per 100 cc.; the urea nitrogen, 20 mg. per 100 cc.; albumin, 4.2 gm. per 100 cc., and globulin, 3.9 gm. per 100 cc.

Course.—On Nov. 17, 1953, the blood pressure was 225/130 mm. Hg and the pulse rate 84 beats per minute. Hydralazine therapy was instituted, 25 mg. intramuscularly every six hours, with blood pressure readings before each succeeding dose. After each injection, severe pounding headaches and lacrimation occurred. After the sixth dose, the blood pressure was 190/110 mm. Hg. The patient refused to continue the use of the drug because the headaches had become "unbearable." Hexamethonium bromide was given Nov. 20, 25 mg. intramuscularly every four hours. On Nov. 21, the blood pressure was 160/85 mm. Hg, and only two doses were given. On Nov. 22, the blood pressure ranged from 160/90 to 190/110 mm. Hg, and 25 mg. every six hours was again given. At 9:15 a. m. on Nov. 24, the patient passed a large tarry stool streaked with fresh blood; the blood pressure was 130/90 mm. Hg, and the pulse rate was 120 beats per minute. He felt weak. A blood study showed the hemoglobin value to be 9.8 gm., the red blood cell count was 3,810,000 per cubic millimeter, and the platelet count was normal. The patient was placed on a bland diet, and aluminum hydroxide was given every two hours. Hexamethonium therapy

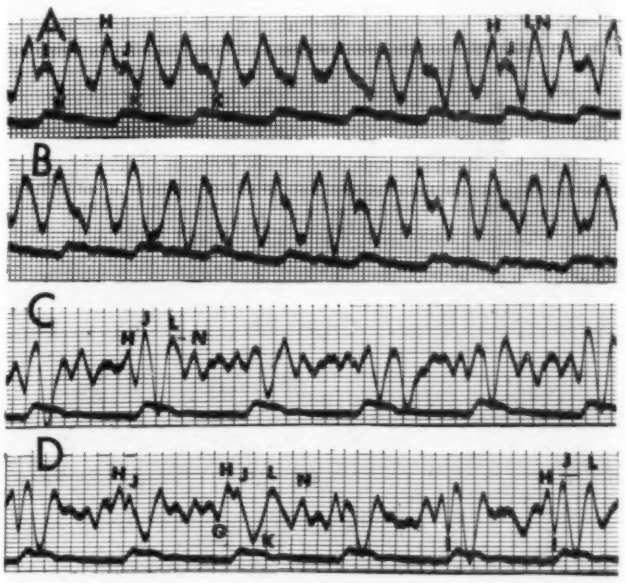

Fig. 1.—Ballistocardiographic studies. *A* and *B* were obtained on admission; *C* and *D*, four weeks after discharge. The upper channel is the ballistocardiogram; the lower channel is the radial pulse trace. The J wave usually is synchronous with the apex of the radial pulse trace. On admission, the basal trace, *A*, and the trace *B*, obtained after light exercise, show bizarre, wide amplitude patterns. The definitiveness of the complexes is obscured by tachycardia. H is taller than J; K is deep; and L and N are fused and tall. Four weeks after discharge, the basal ballistocardiogram, *C*, shows a grade 1 respiratory variation; the expiratory complexes show rounded J waves and shortening of the I-J stroke. In the ballistocardiogram obtained after light exercise, *D*, the expiratory complexes show shortening or absence of the I waves. The third complex illustrates a fused H-J pattern.

was stopped. On Nov. 25, the hemoglobin level was 8.5 gm. A transfusion of 500 cc. of blood was given. The blood pressure was 120/85 mm. Hg. Melena was not evident after 48 hours. Proctoscopic examination showed no gross lesion. A gastrointestinal x-ray study showed considerable deformity of the duodenal cap. On several of the plates, there was evidence of pocketing along the lesser curvature of the duodenum, consistent with the diagnosis of duodenal ulcer (fig. 2). A barium enema study showed a normal colon.

The patient, when told of the diagnosis, recalled that seven years previously he had been troubled with postprandial distress characterized by epigastric burning. These symptoms were relieved after two weeks of dieting and administration of powders. There had been no recurrence since. During this present episode, the patient had no gastrointestinal symptoms.

From the Hypertension and Nephritis Clinic of the Jewish Hospital of Brooklyn.

1. Wilkins, R. W.: Current Drug Treatment of Hypertension, Mod. Concepts Cardiovas. Dis. **22**: 198, 1953.

The patient was given rauwolfia (Raudixin), 50 mg., and alkavervir (Veriloid), 2 mg. twice daily. On discharge, his blood pressure was 150/90 mm. Hg. Four weeks later, the blood pressure was 150/90 mm. Hg. The eye grounds showed no papilledema; a few tiny exudates were seen, but no hemorrhages were seen. The electrocardiogram showed left ventricular hypertrophy. The ballistocardiogram showed remarkable recovery toward a normal pattern (fig. 1*C* and *D*). He had no complaints. Teleroentgenogram showed the transverse diameter of the heart to be within normal limits.

COMMENT

That bleeding peptic ulcers may follow surgical sympathectomy has been recorded in the literature. We have studied a consecutive series of 49 of our patients who had undergone surgical sympathectomy and splanchnicectomy for control of hypertension. In only one patient, a woman 44 years of age who had suffered from recurrent peptic ulcer preoperatively, did extensive gastrointestinal bleeding develop six months after the Smithwick procedure. Bleeding could not be controlled until a subtotal gastrectomy and a vagotomy were done. There had been no recurrence for over five years. A similar case was reported by Steinmann [2] in a woman of 19 on whom he had done a Smithwick sympathectomy and splanchnicectomy. Fifteen months later hemorrhage occurred from a large gastroduodenal ulcer, and a subtotal gastrectomy was necessary to control the bleeding. The patient later revealed that symptoms suggesting a peptic ulcer had been present before sympathectomy. Steinmann [2] refers to other cases in the world literature suggesting that bilateral sympathectomy, in patients with peptic ulcer, may induce severe complications, particularly bleeding. He states that normal epigastric pain sensations are greatly reduced and the vasoconstrictor effect of the sympathetic nerves on the arteries in the splanchnic area is abolished. The vagus tone predominates because of the abolition of the sympathetic counterregulation.

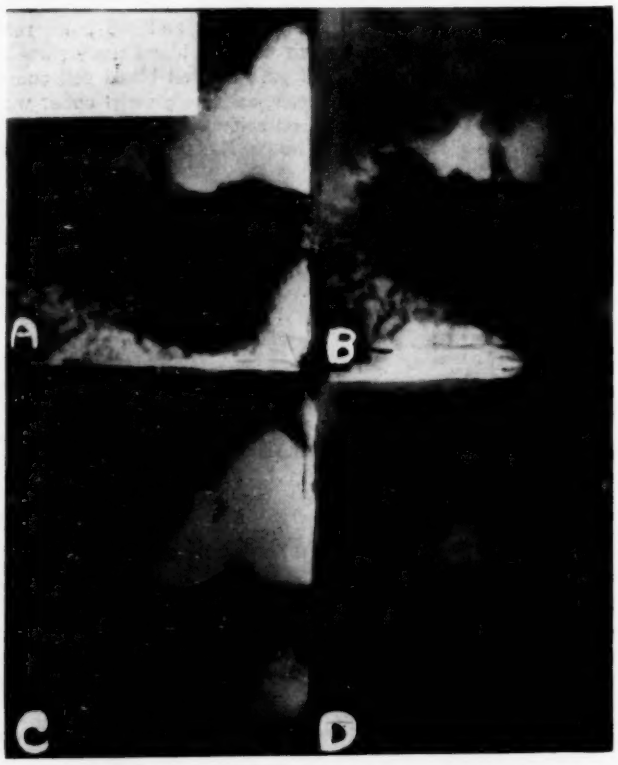

Fig. 2.—Seriogram of duodenal bulb (*A*, *B*, *C*, and *D*) in right anterior oblique projection, showing constant bulbar deformity and crater consistent with the diagnosis of duodenal ulcer. The seriogram was made three days after melena was observed.

Wilkins [1] speculates that the autonomic blockade of adrenergic impulses might allow unopposed hyperacidity to become exaggerated and precipitate hemorrhage from a peptic ulcer. In the experimental animal, however, Smithwick and Kneisel [3] found that sympathectomy does not augment free hydrochloric acid levels. Large gastrointestinal hemorrhages may be caused by venous pooling. Freis and his associates [4] studied the effect of hexamethonium bromide on hypertensive patients with cardiac decompensation. They found that the reduction of systemic arterial pressure was accompanied by a decrease in the pressure in the right side of the heart and in the cardiac output. The total peripheral resistance did not change significantly. They suggested that these alterations were the result of venous pooling and failure of reflex vasoconstriction.

In the evaluation of hypotensive drugs, the selective action of each must be given proper consideration. The hexamethonium salts produce a partial blockade of variable degree of all autonomic ganglions, leading to inhibition of many autonomic functions not concerned with the reduction of blood pressure. In the report by Morrow and associates [5] of 258 patients, the following side effects were reported: orthostatic hypotension, constipation, paralytic ileus, intestinal obstruction, and urinary retention. Hydralazine (1-hydrazinophthalazine), according to Schroeder,[6] acts on the vasomotor center of the hypothalamus and is also an antihistaminase. Hydralazine contributed by its antihistaminase effect to the side reactions listed by Morrow and associates [5]; profound headaches, periorbital edema, lacrimation, and diencephalic flushes were noted. Diminished sweating and warm, dry hands and feet were also observed by Schroeder.[6] Sieber and associates [7] have reported cerebrovascular accidents, myocardial infarction, and uremia.

With prolonged use of these drugs, an alarming increase in the number of toxic reactions has been reported. Morrow and associates [5] found that in 7.2% of their 258 patients there developed a syndrome indistinguishable from disseminated lupus erythematosus. Duston and associates [8] report that in 10% of their patients fever, arthritis, and a syndrome resembling lupus erythematosus developed. An increasing number of cases of interstitial pneumonia with several deaths, especially in Negroes,

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6. Schroeder, H. A.: Effect of 1-Hydrazinophthalazine in Hypertension, Circulation **5**: 28, 1952. Schroeder, H. A.: Control of Hypertension by Hexamethonium and 1-Hydrazinophthalazine: Preliminary Observations, A. M. A. Arch. Int. Med. **89**: 523 (April) 1952.

7. Sieber, H. A.; Grimson, K. S., and Orgain, E. S.: Newer Drugs in Treatment of Hypertension: Use of Hexamethonium Salts, Circulation **8**: 840, 1953.

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are likewise attributed to the toxic action of hydralazine and hexamethonium salts after their continued use.[6]

To the long list of common side-effects and serious toxic reactions, we have added an instance of bleeding from an otherwise quiescent duodenal ulcer. We agree with the policy advocated by Wilkins,[1] that since the hypotensive effect and side-reactions of hexamethonium and hydralazine are unpredictable in any given patient, it seems wise to begin treatment of a new patient with the milder and less disturbing agents. When we are faced with the management of malignant or premalignant hypertension and recourse to sympathectomy is indicated, until less toxic drugs become available, we shall prefer surgical rather than medical sympathectomy.

SUMMARY

Bleeding from a duodenal ulcer developed following the institution of medical sympathectomy by hydralazine and hexamethonium in the treatment of a case of malignant hypertension. This complication simulates a similar experience observed after surgical sympathectomy. The mounting hazards attending the use of hydralazine and hexamethonium salts appear to outweigh the risks of surgical sympathectomy.

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SURGICAL INTERVENTION IN RECURRENT BRONCHOGENIC CARCINOMA

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Carl Davis Jr., M.D.
Calvin O'Kane, M.D.
and
Stanton A. Friedberg, M.D., Chicago

The results of the surgical treatment of bronchogenic carcinoma have been distressingly poor. The five year survival rates of patients in whom this disease causes symptoms have been only 5 to 10% of the entire group.[1] The survival rate is better in patients with bronchogenic carcinoma without symptoms, in whom the tumor has been found incidentally.[2] The patient described in this report presented himself with a recurrent carcinoma in the bronchial stump 18 months after pneumonectomy. No other carcinoma was found. It was decided to explore the chest, to remove the stump of the bronchus, if possible, and to repair the defect with steel wire mesh.[3] The successful reoperation in this patient illustrates that recurrent bronchogenic carcinoma need not be hopeless. No similar case has been found in the available literature.

From the Department of Surgery, the Presbyterian Hospital of the City of Chicago, and the University of Illinois College of Medicine (Rush).

1. Churchill, E. D.; Sweet, R. H.; Soutter, L., and Scannell, J. G.: Surgical Management of Carcinoma of the Lung: Study of Cases Treated at Massachusetts General Hospital from 1930 to 1950, J. Thoracic Surg. **20**: 349, 1950. Ochsner, A.; DeBakey, M. E.; Dunlap, C. E., and Richman, I. M.: Primary Pulmonary Malignancy: Factors Influencing Survival, ibid. **17**: 573, 1948.

2. Overholt, R. H.: Value of Exploration in Silent Lung Disease, Dis. Chest. **20**: 111, 1951.

3. Rob, C. G., and Bateman, G. H.: Reconstruction of Trachea and Cervical Esophagus: Preliminary Report, Brit. J. Surg. **37**: 202, 1949. Bucher, R. M.; Burnett, W. E., and Rosemond, G. P.: Experimental Reconstruction of Tracheal and Bronchial Defects with Stainless Steel Wire Mesh, J. Thoracic Surg. **21**: 572, 1951.

REPORT OF A CASE

A 63-year-old Greek man first entered the Presbyterian Hospital on Nov. 25, 1951, complaining of a cough of three months' duration. Slight dyspnea was present, but there was no history of chest pain or hemoptysis. There had been a 25 lb. (11.3 kg.) weight loss. The patient had smoked more than two packs of cigarettes daily for over 30 years. A "growth" removed from the "throat" of the patient 12 years before was presumed to have been a papilloma of the vocal cord. The rest of the history was noncontributory. Physical examination revealed an

Fig. 1.—Roentgenogram of chest of patient with bronchogenic carcinoma of the upper right lobe, showing increased density in the affected region.

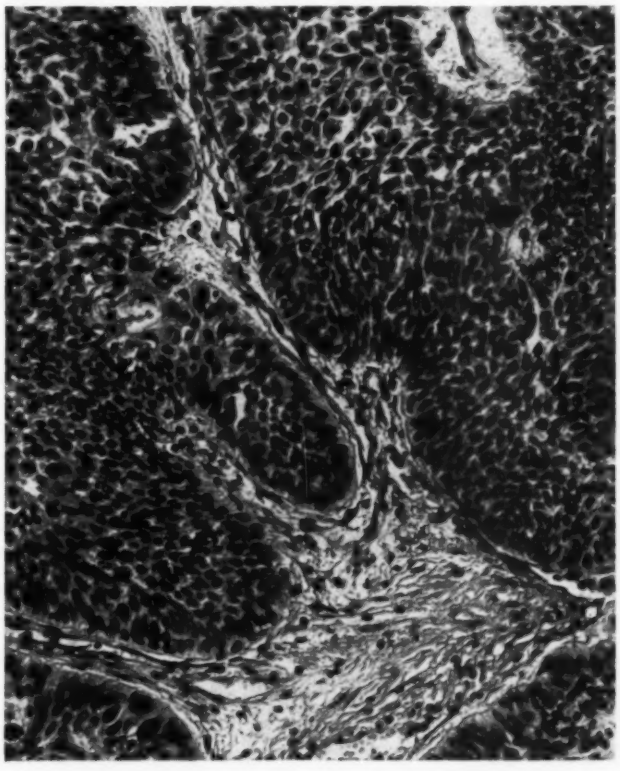

Fig. 2.—Section of bronchogenic squamous cell carcinoma, from upper lobe bronchus of resected lung.

elderly robust man in no distress; there were no abnormal findings except for diminished breath sounds and decreased resonance over the right upper portion of the thorax. The white blood cell count was 12,200 per cubic millimeter. There was no anemia. Roentgenograms of the chest revealed an increased density in the region of the right upper lobe (fig. 1). Bronchoscopy was performed without difficulty. The vocal cords were somewhat thickened but moved normally. A tumor protruded into the orifice of the bronchus of the right upper lobe. A biopsy of this lesion showed bronchogenic carcinoma.

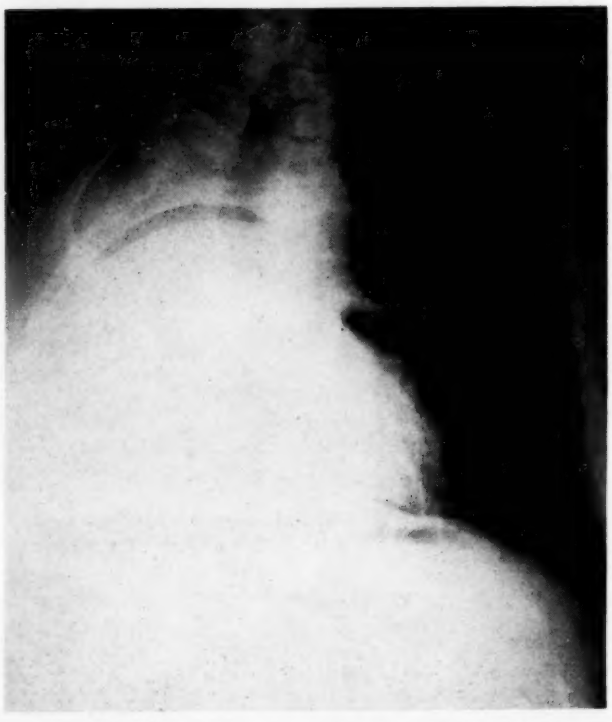

Fig. 3.—Roentgenogram of chest of patient 18 months after resection of right lung.

A right thoracotomy was performed on Nov. 28, 1951. A firm, atelectatic upper lobe was adherent to the chest wall by fibrinous adhesions, which were divided easily. A tumor mass 5 cm. in diameter was palpated in the right upper lobe. A few lymph nodes at the hilum of the lung appeared normal grossly. A right pneumonectomy was performed by one of us (C. D.). The patient convalesced uneventfully and was discharged on the 24th postoperative day. Pathological examination of the right lung revealed a granular friable tumor located in the upper lobe bronchus, with diffuse atelectasis and inflammatory pneumonitis of the right upper lobe. Histological examination showed a squamous cell carcinoma (fig. 2). A section of the bronchus at the point of division failed to reveal tumor cells. There was no evidence of tumor cells in the lymphatic channels or in lymph nodes removed for histological examination.

The patient had been well for 18 months when he began to cough again; a severe episode of coughing resulted in expectoration of dark red blood clots, and small amounts of bright red blood were passed during the next two days. He was readmitted to the Presbyterian Hospital on May 13, 1953. Physical examination was normal except for the absence of the right lung. Roentgenograms of the chest showed an obliterated right pleural cavity. The trachea was displaced to the right (fig. 3). Bronchoscopy was performed, showing normally moving vocal cords. The trachea, displaced to the right, was angulated in its midportion. The carina was sharp. The left main bronchus was normal. The stump of the right bronchus was about 1 cm. long. Arising from the medial wall was a papillary tumor 2 mm. in diameter. Numerous biopsy specimens were taken; microscopic sections showed bronchogenic carcinoma, similar in type to the original tumor (fig. 4). The problem of recurrent tumor was explained to the patient, and he agreed to surgical exploration. The patient entered the hospital for operation on June 7, 1953. Bronchoscopy was repeated; there was an ulcerated area in the right bronchial stump, but no tumor was seen. Pulmonary ventilation tests showed a vital capacity of 1.53 liter (45% of normal) and a maximum breathing capacity of 22.2 liters per minute (23% of normal).

On June 10, 1953, the operation was performed with the patient under nitrous oxide-oxygen-ether anesthesia. A 38 cm. intratracheal tube was inserted, the patient was placed in the left recumbent position, and the chest was entered through the previous operative incision. The fifth, fourth, third, and second ribs were resected as in a Schede thoracoplasty. The dense scar inside the pleural cavity was removed in layers by sharp dissection. After removal of nearly 3 in. (7.6 cm.) of scar, mediastinal fat was identified. Sharp and blunt dissection freed the trachea, carina, and left main bronchus. The right bronchial stump, attached intimately to surrounding structures, was mobilized after tedious dissection. No tumor was encountered. The intratracheal tube was passed into the left main bronchus and tied in place with a heavy ligature. The stump of the right bronchus was excised together with a portion of the wall of the right side of the trachea and a part of the carina. A small segment of fascia lata was obtained from the right thigh, and a piece of double thickness stainless steel mesh, covered with fascia outside the tracheal lumen, was sutured over the tracheal defect. The defect measured about 5 cm. by 2.5 cm. and included nearly 180 degrees of the tracheal circumference. Interrupted 000 silk sutures were used throughout. The intratracheal tube was withdrawn into the trachea, the balloon was reinflated, and the left bronchus was aspirated. Positive pressure revealed a few minute leaks from the suture holes. Two water seal drainage catheters were placed in the right pleural cavity, and the chest was closed with interrupted silk sutures. Immediately after the operation the catheters did not leak air on quiet respiration. The catheters were removed on the fourth postoperative day. Penicillin, 1,200,000 units intramuscularly, and streptomycin, 1 gm. intramuscularly, were given daily for 14

Fig. 4.—Microscopic section of bronchogenic carcinoma recurring on bronchial stump.

days postoperatively. The wound healed primarily, although some drainage of serosanguineous material continued through the drainage tube sites for 10 days. The patient was discharged 21 days after surgery. Microscopic sections of the right bronchial stump showed ulceration of the mucosa with squamous metaplasia. No carcinoma was found. It was felt that the bulk of the recurrent tumor or the tumor in its entirety had been removed in the bronchoscopic biopsies. On Sept. 20, 1953, three months after resection of the bronchial stump, the patient was readmitted to the hospital for follow-up examination. There

Fig. 5.—Laminagram of airway three months after resection of bronchial stump.

were no complaints. Laminagrams showed an excellent airway (fig. 5). Bronchoscopy was performed again. The wire mesh was entirely epithelized except for two small areas 2 to 3 mm. in diameter. The malleable wire mesh had been indented for approximately 5 mm. in the posterolateral part of the trachea. This indentation encroached only slightly on the lumen of the airway. The patient was discharged from the hospital Sept. 22, 1953.

SUMMARY

A 63-year-old white male had a pneumonectomy for bronchogenic carcinoma of the right upper lobe bronchus. He was well for 18 months and then returned with hemoptysis; bronchoscopic examination revealed a recurrent carcinoma in the bronchial stump, which was treated by resection of the remaining segment of the right bronchus, part of the trachea, and part of the carina. The tracheal defect was repaired with stainless steel mesh and fascia lata. Three months later the airway was adequate, the stainless steel graft was almost completely epithelized, and there was no evidence of residual tumor.

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DIAGNOSTIC PROBLEMS

PRESENTATION OF CASE

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An obese Negro, aged 46, first entered St. Luke's Hospital in August, 1950, because of the sudden onset of partial blindness. At that time papilledema, left cardiac enlargement, and hepatomegaly were noted. With medical management, including dietary restriction, he improved subjectively and lost 20 lb. (9.1 kg.) in weight. He was readmitted on Dec. 18, 1951, at which time he gave a history of excessive use of alcohol and heavy smoking. During the week prior to this admission he experienced sudden attacks of dyspnea, cardiac palpitation, epistaxis, diarrhea, and nocturia.

Physical Examination.—When he was admitted to the hospital, his blood pressure was 200/150 mm. Hg. His pulse was 114, and his respiratory rate was 18 per minute. Funduscopic examination of the eyegrounds disclosed exudative retinopathy. His breath had a uremic odor. His heart was enlarged to the left, and moist rales were heard in the lungs, especially on the left. His liver was enlarged.

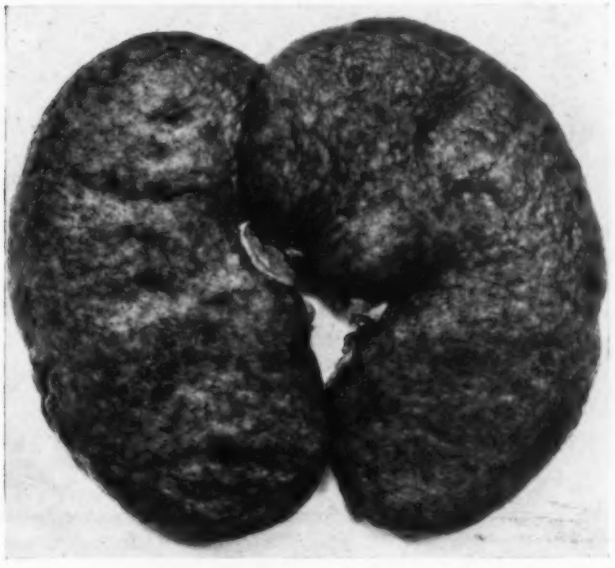


Fig. 1.—Nodular subcapsular surface of the nephrosclerotic kidneys.

Laboratory Findings.—The blood contained 2,540,000 erythrocytes and 16,600 leukocytes per cubic millimeter and 7.1 gm. of hemoglobin per 100 cc. Of the leukocytes, 77% were neutrophils, 9% band forms, 12% lymphocytes, and 2% monocytes. The sedimentation rate was 124 mm. in one hour. The Kahn test of the serum was negative. The blood nonprotein nitrogen level was 164 mg. per 100 cc.; the sugar, 142 mg. per 100 cc.; the phosphorus, 12.5 mg. per 100 cc.; and the carbon diox-

ide combining power, 32.4 vol. %. The acid urine had a specific gravity of 1.006 and contained 300 mg. of albumin per 100 cc., a few erythrocytes, and a few leukocytes.

Course.—The patient became markedly dyspneic and moist rales appeared in both lungs, especially the right. His pulse weakened, and his general condition, despite supportive therapy, became worse. He lapsed into a coma, which deepened, and he died on Dec. 20, 1951.

ANATOMIC DIAGNOSIS

Bilateral nephrosclerosis; edema and passive hyperemia of the lungs; hypertrophy of the myocardium and a small fibrous infarct of the lateral wall of the left ventricle of the heart; and atherosclerosis of the coronary arteries and of the aorta and its main branches.

The body of this adult Negro weighed 165 lb. (74.8 kg.) and was 157 cm. long. The lungs were expanded, and only a few cubic centimeters of fluid were found in each pleural space. The pericardial sac contained a small amount of clear, faintly yellow fluid; the lining surface was smooth. The lining of the aorta was mottled moderately by fibrous and fatty plaques. The heart weighed 520 gm. There was marked hypertrophy of the myocardium but no significant changes of the valve leaflets. The kidneys weighed 180 and 170 gm. (fig. 1 and 2). The capsule of each was stripped from a nodular gray and red-brown mottled surface. On surfaces made by frontal hemisection of the kidneys, the cortex and medulla were not sharply demarcated. The cortex tissues were red-brown with flecks of yellow, and the markings were indistinct. The dark red pyramidal tissues had the usual radiations. The spleen weighed 180 gm.; the liver, 1,850 gm.; the edematous right lung, 840 gm.; the similar left lung, 660 gm.; and the brain 1,310 gm. Histologically the tufts of the glomeruli in the kidneys were in phases of hyalinization and contraction, a few tufts had dilated capillaries, and with some of these hemorrhages into the Bowman's space were found. Many of the tubules were atrophic; others, which were dilated, contained granular precipitates and were lined by flattened cells. The wall of the small arteries and arterioles was hyalinized, and the lumen of some was obliterated. The renal changes were those of arteriolar nephrosclerosis of the kidneys.

Fig. 2.—The surfaces made by frontal hemisection of the nephrosclerotic kidneys.

COMMENT

Gilbert H. Marquardt, M.D., Chicago

This patient was first treated 16 months before his death for sudden blindness. At that time he showed papilledema, cardiomegaly, and hepatomegaly. From the subsequent history, it seems most probable that the patient's ocular symptoms and findings were caused by a grade 4 hypertensive retinopathy, although a superimposed uremic retinopathy at that time cannot be excluded by the history. The cardiomegaly was undoubtedly secondary to a grade 3 essential hypertension. The hepatomegaly could have been due to cardiac decompensation, but the history of the first admission is not suggestive of myocardial failure. The history suggests the possibility of portal cirrhosis (which is not established or denied in the pathological report).

The second admission revealed the typical story of cardiac decompensation secondary to hypertensive cardiovascular disease and renal insufficiency arising from arterial and arteriolar nephrosclerosis. The patient's erythrocyte count and hemoglobin level were compatible with his azotemic state. The leukocytosis with 86% polymorphonuclear leukocytes was probably secondary to bronchopneumonia superimposed on the cardiac decompensation and pulmonary edema. The elevated serum phosphorus level, lowered carbon dioxide combining power, and the low specific gravity and acidity of the urine are characteristic of the acidosis of severe azotemia. The elevated sedimentation rate (124 mm. per hour) is higher than that usually accompanying uremia alone and is probably due in part to an infectious process, that is, bronchopneumonia. A blood sugar level of 142 mg. per 100 cc. is compatible with uremia and the general physiological alarm type of reaction occurring with uremia; true diabetes mellitus cannot be excluded on the information afforded, however. The remainder of the urinary findings (i. e., albuminuria, hematuria, and pyuria) are usual with advanced arterial and arteriolar renal disease.

The clinical picture during this patient's last hospital admission and death is not unusual, since cardiac decompensation and acidosis (secondary to renal insufficiency) are the physiological end-points of the anatomic changes reported as a result of this patient's necropsy.

The treatment in a case of this type would be directed toward maintaining the acid-base equilibrium as close to normal as possible. The use of an artificial kidney is not justified in a patient with such severe underlying renal damage.

COUNCIL ON PHARMACY AND CHEMISTRY

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

R. T. STORMONT, M.D., *Secretary.*

Aminophylline-U.S.P. (See New and Nonofficial Remedies 1954, p. 356).

The Vitarine Company, Inc., New York.

Tablets Aminophylline: 0.1 and 0.2 gm.

Amphetamine Phosphate (See New and Nonofficial Remedies 1954, p. 214).

Keith-Victor Pharmacal Company, St. Louis.

Tablets Amphetamine Phosphate: 5 mg.

Amphetamine Sulfate-U.S.P. (See New and Nonofficial Remedies 1954, p. 214).

The Evron Company, Inc., Chicago.

Tablets Amphetamine Sulfate: 5 and 10 mg.

Keith-Victor Pharmacal Company, St. Louis.

Tablets Amphetamine Sulfate: 5 and 10 mg.

Ascorbic Acid-U.S.P. (See New and Nonofficial Remedies, 1954, p. 567).

Keith-Victor Pharmacal Company, St. Louis.

Tablets Ascorbic Acid: 25, 50, and 100 mg. unflavored; 100 mg. flavored.

Dienestrol (See New and Nonofficial Remedies 1954, p. 414).

Victor M. Hermelin and Company, Division of Keith-Victor Pharmacal Company, St. Louis.

Tablets Dienestrol: 0.5 mg.

Diethylstilbestrol-U.S.P. (See New and Nonofficial Remedies 1954, p. 415).

Keith-Victor Pharmacal Company, St. Louis.

Tablets Diethylstilbestrol: 1 mg.

Estrone-U.S.P. (See New and Nonofficial Remedies 1954, p. 404).

Pfizer Laboratories, Division of Chas. Pfizer & Company, Inc., Brooklyn, N. Y.

Suspension Estrone: 10 cc. vials. A suspension containing 2 or 5 mg. of estrone in each cubic centimeter. Preserved with 0.01% thimerosal.

Folic Acid-U.S.P. (See New and Nonofficial Remedies 1954, p. 553).

Keith-Victor Pharmacal Company, St. Louis.

Tablets Folic Acid: 5 mg.

Fructose (See New and Nonofficial Remedies 1954, p. 488).

Mead Johnson & Company, Evansville, Ind.

Solution Levugen 10% with Electrolytes: 1 liter bottles. A solution containing 0.1 gm. of fructose, 1.8 mg. of sodium chloride, 0.9 mg. of dibasic potassium phosphate, and 0.4 mg. of potassium chloride in each cubic centimeter.

Mephenesin (See New and Nonofficial Remedies 1954, p. 511).

Victor M. Hermelin and Company, Division of Keith-Victor Pharmacal Company, St. Louis.

Tablets Mephenesin: 0.25 gm.

Mersalyl Sodium and Theophylline (See New and Nonofficial Remedies 1954, p. 353).

C. F. Kirk Company, New York

Solution Mersalyn with Benzyl Alcohol 2%: 30 cc. vials. A solution containing 0.1 gm. of mersalyl sodium (equivalent to 40 mg. of mercury) and 50 mg. of theophylline in each cubic centimeter.

Methyltestosterone-U.S.P. (See New and Nonofficial Remedies 1954, p. 444).

The Evron Company, Inc., Chicago.

Tablets Methyltestosterone: 10 mg.

COUNCIL ON PHYSICAL MEDICINE AND REHABILITATION

APPARATUS ACCEPTED

The following additional product has been accepted as conforming to the rules of the Council on Physical Medicine and Rehabilitation of the American Medical Association for inclusion in Apparatus Accepted. A copy of the rules on which the Council bases its action will be sent on application.

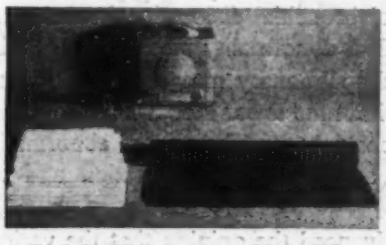
RALPH E. DE FOREST, M.D., *Secretary.*

S. & L. Enuresis Alarm, Model DP

S. & L. Signal Co., 525 Holly Ave., Madison 5, Wis.

The S. & L. Enuresis Alarm, Model DP, an electric device used in the treatment of enuresis, sounds an electric bell when the bed pad is wet by the patient.

This model differs from the previously accepted S. & L. Enuresis Alarm, Model D, in the following respects. The pads that are placed under the patient are made of a black conductive fabric (instead of a wire screen). The upper pad has small perforations (about 2 mm. in diameter and about 1 cm. apart) over its entire area except near the margins; the two pads are separated by a sheet of flannel. The bed pad cord is permanently attached to the control box (instead of using a jack as does Model D).



S. & L. Enuresis Alarm, Model DP.

The conductive pads measure 66 by 48 cm. (26 by 19 in.); the control box measures 21.5 (height) by 13 by 20 cm. (8⅜ by 5 by 7⅞ in.). Packed for shipment the complete apparatus measures 15 by 53 by 30.5 cm. (6 by 21 by 12 in.) and weighs 5.9 kg. (13 lb.). For operation the unit requires one 6 volt A-battery, which rings the bell, and one 22.5 volt B-battery, which supplies the circuit through the pads. The latter circuit becomes effective when the resistance between the pads falls below 500 or 600 ohms; the relay then activates the bell circuit.

The Council obtained evidence indicating that this device was effective when proper physical and psychological examination of the patient had eliminated anatomical defects or unfavorable influences in the environment as possible factors in the enuresis and that the apparatus was safe to use under medical supervision.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION
535 N. DEARBORN ST. . . . . CHICAGO 10, ILL.
Editor . . . . . AUSTIN SMITH, M.D.
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Subscription price . . Fifteen dollars per annum in advance
Cable Address . . . . . "Medic, Chicago"

INTRALOBAR BRONCHOPULMONARY SEQUESTRATION

Harris and Lewis [1] reported in 1940 a fatality due to damage to a large abnormal pulmonary artery in the course of a lobectomy for a pulmonary abscess in a 5-year-old girl. Post mortem revealed that the artery arose from the descending thoracic aorta 2 cm. above the diaphragm and entered the posterior border of the left lower lobe. The diameter of the artery was the same as that of the celiac axis of the patient. Haight [2] in 1942 cited two instances of left lower lobe cysts that had a large anomalous pulmonary artery coming through the diaphragm and supplying the lobe containing the cysts. He suggested that these epithelial cysts and the congenital arterial anomaly were probably directly related. Pryce [3] reported in 1946 and again in 1947 on eight cases of a congenital abnormality that consisted of a large artery at the base of the lung from the nearby aorta and a congenital bronchial dislocation in the part supplied. The bronchial abnormality in each case took the form of a bronchopulmonary mass or cyst, which, although included within the lower lobe, was dissociated from the normal bronchial tree. The arterial abnormality was not related to any cardiac malformation and was purely accessory.

Pryce advanced the opinion that the various degrees of sequestration could all be explained on the basis of detachment of a bulbous tip of the bronchial tree at various stages of its development. The various degrees of sequestration would result from long-continued traction between the sequestrated mass anchored down by the abnormal blood supply and the normal lung slowly shifting from its original position. The abnormal artery was elastic and of systemic pulmonary type. There were adhesions, but the abnormal artery was situated in the line of the pulmonary ligament. In two of Pryce's cases the abnormal artery supplied adjacent sectors of the normally connected lung. Pryce concluded that the abnormal artery was the primary lesion, and he refers to cases in which it was present by itself. Sequestration, in his opinion, resulted from separation of a bronchial tip of the embryonic bronchial tree and from traction by the adventitious blood supply. Pulmonary sequestration occurs in various degrees, such as complete, intralobar, or extralobar, depending on the stage in embryonic life at which it occurs. Traction by such delicate structures as embryonic blood vessels, which are essentially capillaries, can lead to amputation of the developing bronchial tree, because the latter structures also are fragile, being composed only of thin epithelium embedded in mesenchyme.

The abnormal artery is a definite hazard in the operation of lower lobectomy, since it is usually of considerable size and arises in a relatively inaccessible angle. Three types of arterial abnormality were observed: (1) abnormal artery to normally connected lung, (2) abnormal artery to sequestration mass and adjacent normal lung, and (3) abnormal artery confined to the sequestration mass. The abnormal artery is usually in the region of the pulmonary ligament and arises from the lower part of the thoracic aorta or the upper part of the abdominal aorta.

The clinical symptoms are referable to infection, which tends to begin in early life. The initial symptoms are usually those of pneumonia, which usually subsides. The clinical diagnosis is difficult, although the condition is sometimes discovered from routine roentgenograms of the chest. The majority of the patients come to surgery because of repeated acute pulmonary episodes associated with intermittent cough, occasional blood-streaked sputum, fever, chills, and the evidence of a pathological process in one or the other lower pulmonary lobe.

McDowell and associates [4] reported one case in which a correct diagnosis was tentatively made before the operation. Bruwer, Clagett, and McDonald [5] in 1950 reported five cases from the Mayo Clinic and five additional cases in 1954. These authors were able to collect from the literature 79 surgical cases of intralobar bronchopulmonary sequestration. Among these a number of cases have been erroneously diagnosed as lung abscess or empyema following pneumonia and the patients were subjected to one or more drainage operations. The observations of Tosatti and Gravel, Findley and Maier, Cole and associates, Wyman and Eyler, Santy and associates, and Kergin and others suggest that the condition is much commoner than was hitherto believed. Intralobar bronchopulmonary sequestration is a definite pathological and clinical entity. Excision of the diseased segment or of the lobe constitutes a satisfactory method of treatment.

1. Harris, H. A., and Lewis, I.: Anomalies of the Lungs with Special Reference to the Danger of Abnormal Vessels in Lobectomy, J. Thoracic Surg. **9**: 666-671 (Aug.) 1940.

2. Haight, C., in discussion on Brown, A. L., and Brock, W.: A Method of Treatment of Large Pulmonary Air Cysts (Balloon Cysts) by an Endocutaneous Flap, J. Thoracic Surg. **11**: 617-636 (Aug.) 1942.

3. Pryce, D. M.: Lower Accessory Pulmonary Artery with Intralobar Sequestration of Lung: A Report of Seven Cases, J. Path. & Bact. **58**: 457-467 (July) 1946. Pryce, D. M.; Sellors, T. H., and Blair, L. G.: Intralobar Sequestration of Lung Associated with an Abnormal Pulmonary Artery, Brit. J. Surg. **35**: 18-29 (July) 1947.

4. McDowell, C.; Robb, D.; Hinds, J. R., and Nicks, R.: A Case of Intralobar Sequestration of the Lung Associated with an Abnormal Pulmonary Artery, Brit. J. Surg. **39**: 87-91 (July) 1951.

5. Bruwer, A.; Clagett, O. T., and McDonald, J. R.: Anomalous Arteries to the Lung Associated with Congenital Pulmonary Abnormality, J. Thoracic Surg. **19**: 957-972 (June) 1950; Intralobar Bronchopulmonary Sequestration, Am. J. Roentgenol. **71**: 751-761 (May) 1954.

THE PROPER STUDY OF MANKIND

In a timely discussion of man as an investigator and as a subject in biological research, Ingle [1] makes a careful analysis of certain human limitations. The fact that the human mind can accept erroneous concepts as truths is manifested by the wholeheartedness with which divergent political, social, and religious views are embraced. This failing is not restricted to the untutored but may be observed in scientists as well. The validity of a scientist's observations is further limited by the amount of data available to him and by the capacity of his mind to understand. Although the limits of the mind's ability to learn are not clearly defined, there can be no doubt that limits exist. The attention can be focused on only a narrow field at any given moment, and the more complex and multifaceted an idea is, the more difficult it is to grasp. Man has extended his ability to manipulate data through the use of electronic calculators, but even this approach is limited by the span of comprehension of the designer and the operator of the machine.

In the course of our personal development, most of our concepts about the external world have had to be taken on faith, and thus we become conditioned to accept the suggestions of our fellows without critical examination. The physician makes capital use of suggestion in the treatment of psychogenic illnesses, but even the investigator is influenced by suggestions in ways he may not recognize unless he is especially watchful. He will, for example, search far more diligently for errors in an experiment when the results run counter to his expectations than when they support them. The effects of suggestion in the evaluation of new drugs have become so well known that it has become imperative to test them in such a way that neither the patient nor the physician knows whether a given patient is getting the active drug or an inert counterpart.

In setting up experimental conditions, it must be recognized that there are always some variables that cannot be completely controlled, such as sampling errors, differences among persons within a sample, differences in environmental factors, and errors of measurement. Every naturally occurring variable in an experimental setup is an added dimension of the problem to be explored and must be correlated with other variables. Ingle ends his discussion with a plea for greater emphasis on research in education. No student should complete his education without having sought to solve one problem the answer to which is not known. A book on the general principles and philosophy of research is needed. Studies are also needed to determine what attributes contribute to success as a researcher and what kind of teacher best motivates students to enter investigative fields. It has been amply demonstrated in recent years that men can be taught to follow false prophets and unscrupulous leaders. How much more profitable to society it would be to inspire them to seek new truths.

ACCIDENTS AMONG AMERICAN WOMEN

More than 22,000 American women 15 years and over die each year as a result of injuries sustained in accidents; thus more women perish from accidents than from any other cause except cardiovascular diseases and cancer. According to a recent study,[1] the three leading causes of accidental injury in this group—motor vehicles, falls, and burns and conflagrations—account for almost four-fifths of all accidental fatalities. Falls are responsible for about one-seventh of all deaths from accidents, with conflagrations and burns responsible for about one-tenth of the fatalities. Motor vehicle mishaps constitute the major hazard, accounting for more than half of all accident fatalities among women. Four out of every five women killed in automobile accidents were passengers or drivers, the others being pedestrians. Although millions of American women are gainfully employed, relatively few are killed in industrial accidents. Surprisingly enough, one-quarter of the fatal accidents among women under age 65 occur in and about the home, this despite the presence of modern equipment and appliances that have made the American home a much safer place in which to live.

The death rate from accidents among women in the age range 15 to 64 decreased by more than 40% in the period between 1930-1932 and 1950-1952. Further reduction in the death toll from accidents could be made if American women, who occupy a most important position in organizations devoted to health and conservation of life, would focus greater energy and attention on the circumstances responsible for fatal accidents. In this connection, the efforts of women should be primarily educational to acquaint persons, young and old, with the nature of the accident hazards that lurk on the American scene and to induce them to apply established principles of safety in everyday life.

Many women realize that thousands of Americans are killed unnecessarily as the result of carelessness; hence the early need for inculcating a sense of responsibility among children. More careful supervision of children by parents and greater stress on safety education in the secondary schools, the 4-H clubs, and the boy and girl scout organizations, to name an important few, would undoubtedly reduce the loss of life among young persons. In addition an intensive educational program should also be conducted among adults, through Parent-Teacher associations, women's clubs, church organizations, and the like, for the purpose of emphasizing the need for safety precautions around-the-clock, not just during periods of enthusiasm. From coast to coast and from border to border, American women could very well adopt as a motto, without differences of opinion, the theme "*Don't be a fatal accident statistic in 1954.*"

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1. Ingle, D. J.: Psychological Barriers in Research, Am. Scientist 42: 283 (April) 1954.

1. Large Accident Toll Among Women, Statist. Bull. Metrop. Life Insur. Co. 35: 6 (March) 1954.

THE PRESIDENT'S PAGE

A MONTHLY MESSAGE

This is the last President's Page that will appear over my signature. It is my earnest desire to convey to the medical profession of the United States my sincere gratitude for the opportunity that you have given to me to serve you and the public. One of the great Presidents of the United States said that "every man owes something to the profession to which he belongs." I must say to you frankly that many doctors have given little evidence of a desire to make any sacrifice in behalf of medicine. As a matter of fact, some physicians look upon those who spend their time and money to protect the advances made by medicine as a group of medical politicians. They offer neither help nor thanks. Where would medicine be today if hundreds of our outstanding medical men had not left their homes and practices and spent countless hours "on the bridge" steering our ship "through dangerous waters?" No doubt we would still have diploma mills, poor and second-rate medical service, and government compulsion.

I would ask you to read my last speech to the House of Delegates of the American Medical Association. I have tried to point out the progress we have made during the past 12 months in doctor distribution, emergency medical service, grievance committee operations in all states and counties, improvement in our doctor-hospital relationship and expansion of voluntary insurance, physician activity in lay organizations, and making known the necessity of improvement in the public relations techniques in the offices of doctors. I have requested the interest of the individual physician in our national and state problems. In addition, I have suggested consideration of certain changes in our approach to the health insurance problem, which changes I deem absolutely necessary if we are to meet the challenge of certain groups. We cannot attain victory if we do not give honest thought and consideration to the suggestions of others who have a great interest in medical care.

We have the best doctors and the best medical care in the world. There has been a great tendency to exaggerate the medical needs of the American people, and there has also been a constant expansion of government in the medical field. This expansion has reached the point of actual danger to the American system of medical care and the American way of life.

I am indeed grateful to all members of our headquarters staff and the executives and officers of state and county medical societies. We could not function without them. They are without exception dedicated persons whose abilities and talents would perhaps receive greater recognition in other fields of endeavor. I have traveled thousands of miles during the past two years and I have seen these men and women in action. We doctors owe to them a debt that we shall never be able to repay.

There are few physicians who know the work of our many councils and committees at the national and state level. My last request to the House of Delegates was that each member of the House not only attend the semiannual and annual meetings of the House but fulfill his or her duty by visiting all state and regional meetings and bring the members at the "grass roots" up-to-date on the activities at the national level. This is very important. Thousands of letters sent to me and many conversations with doctors over the nation attest the necessity of this educational venture.

During my travels I have had the opportunity of bringing medicine's message to large lay groups. I would suggest in the future when your President is invited to speak or when some other officer or representative of the American Medical Association or of state medical associations appears in various localities throughout the nation that, in addition to physicians, large groups of lay leaders comprise the audience. It does little good to speak before small audiences of physicians who are present, because they know our problems, but a frank discussion of our aims and purposes before lay groups makes many converts, especially among those persons who gain their information about medical matters from magazines that specialize in sensational and lurid articles containing little truth. The American public has great faith in its doctors but has no means of knowing our high ideals and our desire to serve except through actual contact with our leaders.

Many honors have come to me since I took the oath of office as your President. They were not presented to me as an individual but as your representative. They are mute evidence of a trust that we must not betray. Permit me to once again emphasize the necessity of cleaning our house at the local level.

Thank you for the opportunity to serve medicine. May God bless you all and keep alive in your hearts the teachings of Hippocrates and those of the founding fathers of this great nation.

EDWARD J. MCCORMICK, M.D., Toledo, Ohio

ORGANIZATION SECTION

FLORIDA MEDICAL ASSOCIATION

The Florida Medical Association was founded in Jacksonville on January 14, 1874, at the instigation of the Duval County Medical Society, which had been formed 21 years previously. Jacksonville, where the association still maintains its headquarters, has been important in many ways in Florida's medical history, as shown in the centennial volume, published by the Duval County Medical Society in 1953 under the editorship of Dr. Webster Merritt.

Dr. James Hall is described as "not only Jacksonville's first physician, but probably the first American (United States) physician to practice medicine in Florida for an extended period of time." Having arrived in Florida in 1798, he settled near Cow Ford (later renamed Jacksonville in honor of Gen. Andrew Jackson, provisional governor) and practiced medicine for nearly 25 years under the law of Spain. In 1821, shortly after ratification of the treaty by which Spain ceded the Floridas, East and West, to the United States, General Jackson signed

Florida Theatre Building, Jacksonville, in which the Florida Medical Association has its headquarters.

an ordinance designed for the preservation of health in Florida. It provided for routine quarantine of vessels arriving at Pensacola, establishment there of a hospital, formation of a board of health, appointment of a health officer, and payment of such allowances "to the Resident Physician and Health Officer (all their services included) as shall not exceed one dollar and one half for each person on board of each vessel."

In 1848, three years after Florida was admitted to the Union and a year after the founding of the American Medical Association, an attempt was made to organize a state medical association in Gadsden County, but interest and leadership were lacking. It was only after epidemics of dengue in 1850 and smallpox and scarlet fever in 1853 that the Duval County Medical Society was founded on May 25, 1853. This was the first medical society to be organized in Florida and was largely responsible for establishing the Medical Association of the State of Florida on Jan. 14, 1874, "to organize the Medical Association throughout the State in the most efficient manner, to promote union, harmony and good feelings among the members, to establish and maintain a high standard of professional acquirement of ethics, and to inspire interest and zeal for the cultivation of medical science and literature."

The association, with its membership of about 2,500, has 4 medical districts that are in turn divided into 8 councilor districts comprising 36 county medical societies. Each fall a one day medical meeting is held in each of the four districts. The annual meeting of the association in April has convened for the past four years at the Hollywood Beach Hotel in Hollywood.

The association maintains several projects, among them a fair exhibit, first shown at the Florida State Fair in Tampa in February, 1952, and subsequently at other fairs in the state. The exhibit stresses the fact that Americans spend about 24.6 billion dollars a year for such things as tobacco, alcohol, toilet articles, and recreation as compared with 7.9 billion for medical care. Free blood grouping and typing and blood pressure determinations are offered to the public whenever the exhibit is shown. Many county societies have cooperated with local newspapers in presenting medical forums, and a code of cooperation is in force to guide news representatives of the press, radio, and television in their relationship with the association.

Officers of the association, 1954-1955, are: Dr. Duncan T. McEwan, Orlando, president; Dr. John D. Milton, Miami, president-elect; Drs. V. Marklin Johnson, West Palm Beach, Frederick H. Bowen, Jacksonville, and Rowland E. Wood, St. Petersburg, vice-presidents; Dr. Samuel M. Day, secretary-treasurer; and Dr. Shaler A. Richardson, Jacksonville, editor of the journal. The *Journal of the Florida Medical Association*, was established in 1914. Mr. Ernest R. Gibson, Jacksonville is acting managing director.

BUREAU OF MEDICAL ECONOMIC RESEARCH

This is one of a series of brief statements explaining the work of various departments of the American Medical Association. —ED.

The Bureau of Medical Economic Research studies all phases of economics pertaining to the practice of medicine, including such subjects as supply and demand and cost and price aspects of medical care. The results of these studies are published by the Bureau for the use of the medical profession. Established in 1931 as the Bureau of Medical Economics, it was reorganized in 1946 under its present title. The Bureau's statistical findings serve as a guide to better medical care. Its publications have exploded many pet notions about medical economics that were not supported by sound data. Physicians and medical societies use Bureau information in planning for improved medical education, distribution of doctors, voluntary insurance plans, and so on. By placing medical care in its proper perspective with relation to other consumer expenditures, the public is shown that better health pays.

The Bureau conducts detailed research projects arising from current medical economic problems. Two recent studies were concerned with the distribution of physicians and patients by medical service areas and the incomes of physicians. Usually facts are gathered through mailed questionnaires, although data published by state and federal agencies and by economic research organizations also are used. Bureau publications containing detailed research information reach a substantial number of physicians, practically all medical organizations, and a large number of high schools, colleges, universities, governmental agencies, and lay leaders throughout the country. Information includes such topics as costs and prices of medical care, leading causes of death, and group practice. The Bureau answers numerous queries from physicians and interested medical groups for use in preparing speeches and special health programs.

The Bureau's I. B. M. machines are used primarily for research purposes. In addition, the Bureau compiles data for other Association committees, councils, and bureaus, such as surveys on blood banks and special statistical tables in the hospital number of THE JOURNAL. An offshoot is the punch card system of the Membership Department. The accounting work of the American Medical Education Foundation is also done on these machines. The Bureau maintains a continuous census of physicians in the form of punch cards, showing a wide variety of statistical data. Later these cards will be used for drawing up random samples of physicians for questionnaires and other information.

MEDICAL NEWS

CALIFORNIA

Medical Symposium.—The School of Medicine and Medical Extension of the University of California at Los Angeles, in cooperation with the San Diego County Medical Society, has scheduled the following symposiums: Highlights of Clinical Endocrinology (July 28), Use of Physical Medicine in General Practice (Aug. 4), and Problems in Anesthesia (Aug. 11). All sessions will meet in the fourth floor conference room of the Surgical Building, San Diego County General Hospital. Applications or requests for information concerning fees and hours of these courses should be made to Dr. Thomas H. Sternberg at Medical Extension, University of California, Los Angeles 24.

GEORGIA

State Medical Election.—Newly elected officers of the Medical Association of Georgia include: Dr. Peter B. Wright, Augusta, president; Dr. H. Dawson Allen, Milledgeville, president-elect; Dr. Willard R. Golsan, Macon, and Dr. Milford B. Hatcher, Macon, first and second vice-president, respectively; and Dr. David H. Poer, Atlanta, secretary-treasurer.

Society News.—Under the chairmanship of Dr. Christopher J. McLoughlin, the public relations committee of the Fulton County Medical Society is sponsoring a course for physicians' secretaries in Atlanta. At the first of four meetings, May 25, at the Academy of Medicine, Dr. John Turner, Atlanta, president of the Fulton County society, welcomed the group of 240 secretaries. Good telephone usage was the main subject of the meeting, and a fashion show featuring "working clothes" was presented. Atlanta dentists have requested that the same course be open to their secretaries, but since the quota has been exceeded, Dr. McLoughlin plans to offer the course again in the fall.

MASSACHUSETTS

Dr. Cattell Honored.—At its commencement exercises, June 6, Boston University conferred on Dr. Richard B. Cattell, member of the Lahey Clinic since 1927 and its director since 1953, the honorary degree of doctor of science. Dr. Cattell is surgeon in chief, New England Deaconess Hospital, surgeon, New England Baptist Hospital, and honorary consultant, Bureau of Medicine and Surgery, U. S. Navy.

MICHIGAN

Geriatric Conference.—The University of Michigan will hold its annual Conference on Aging at Ann Arbor, June 28 to 30. The conference, which will be conducted as a workshop, has as its theme "Aging—Everybody's Business." For information write to Wilma T. Donahue, Ph.D., Chairman, Division of Gerontology, 1510 Rackham Building, Ann Arbor.

MISSISSIPPI

New Headquarters of State Medical Society.—The Mississippi State Medical Association announces the removal of its central office from 507-508 First Federal Building to 860 Milner Building, Jackson.

Personal.—Dr. Louis F. Rittelmeyer Jr., who formerly practiced medicine in Lucedale, has joined the staff of the University of Tennessee College of Medicine, Memphis, as assistant director of the general practice department.

Narcotic Violation.—Dr. John W. Horn, Lucedale, pleaded *nolle contendere,* Feb. 10, in the U. S. District Court of Biloxi, to a charge of violating the Federal narcotic law, and on the same day was sentenced to a term of two years. His sentence was suspended, and he was placed on probation for two years.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education and public health. Programs should be received at least three weeks before the date of meeting.

MISSOURI

New Chairman of Pathology Department.—Dr. Joseph E. Flynn, associate professor of pathology at the Columbia University College of Physicians and Surgeons, New York, has been appointed professor of pathology at the University of Missouri School of Medicine, Columbia, effective July 1. He replaces Dr. M. Pinson Neal who will continue as professor of pathology.

NEBRASKA

Crippled Children's Clinics.—The following clinics have been scheduled for crippled children: June 26, Scottsbluff, St. Mary Hospital; July 10, Norfolk, Norfolk State Hospital; July 24, McCook, St. Catherine of Sienna Hospital; Aug. 7, North Platte, Knights of Columbus Building; Aug. 14, Chadron, Elks Club; and Aug. 28, Grand Island, St. Francis Hospital.

Personal.—In celebration of his 38 years of medical practice, Dr. Joseph E. Ingram, Nelson, was recently honored at a reception attended by nearly 1,100 persons. State Senator William A. McHenry of Nelson read a letter of commendation from Gov. Robert B. Crosby to Dr. Ingram and presented the physician with an admiral's commission in the Nebraska Navy.

NEW YORK

Dr. Witebsky Honored.—The rank of Distinguished Professor, established by the University of Buffalo, June 4, was conferred on Dr. Ernest Witebsky, chairman, department of bacteriology and immunology, University of Buffalo School of Medicine, one of three faculty members so honored. Dr. Witebsky, one of the original organizers and chairman of the International Society of the Hematology program in Buffalo in 1948, is an editor of the *Journal of Immunology* and *Blood—The Journal of Hematology.*

Health Camp Discontinued.—The Brooklyn Tuberculosis and Health Association, recognizing that tuberculosis in children is no longer a deciding factor in the general tuberculosis control problem and acting on the advice of the National Tuberculosis Association, is discontinuing the maintenance and operation of Camp Christmas Seals at Bear Mountain. The camp, which gave supervised care to undernourished children and children from families having a history of tuberculosis, was in operation for more than 25 years.

New York City

Courses for Surgeons.—The New York Medical College, Flower and Fifth Avenue Hospitals, 106th St. and Fifth Ave., New York 29, announces (1) a basic science course leading to the degree of master of medical science in surgery, starting Oct. 4 (9 months full time to be followed by 2 years of residency, $910) and (2) a course in surgery (G 101-114 inclusive), starting Oct. 4 (9 months full time to be followed by 2 years of residency, $910).

Dr. Lanza Appointed Professor Emeritus.—Dr. Anthony J. Lanza, professor and chairman of the department of industrial medicine and director of the Institute of Industrial Medicine, New York University-Bellevue Medical Center, who is retiring at the end of this academic year, has been appointed professor emeritus of the Post-Graduate Medical School. He will continue to act as a consultant in industrial medicine and lend his support toward the development program of the center.

Capen Award to Dr. Heyd.—The University of Buffalo recently presented its annual Samuel P. Capen Alumni award to Dr. Charles Gordon Heyd, professor of surgery at the Post-Graduate Medical School of the New York University-Bellevue Medical Center. Dr. Heyd, a past president of the American Medical Association, the Medical Society of the State of New York, and the New York County Medical Society, is the founder of the New York City Area Alumni Post-Graduate Club of the University of Buffalo.

OHIO

Binz Memorial Scholarships.—A new scholarship program to enable students without financial resources to obtain a medical education has been established at the Western Reserve University School of Medicine, Cleveland. The Emma and Frank Binz memorial scholarships, to be made on a four-year basis, provide a total of $5,500 each. Two Binz scholars will be appointed annually, beginning with the academic year 1955-1956. The scholarships will be used to "assist worthy and needy students without discrimination as to race, color or creed of the students to be benefited." Applications and information on the scholarships are available from the Committee on Admission, School of Medicine, Western Reserve University, Cleveland 6.

PENNSYLVANIA

University News.—At the 46th annual meeting of the Undergraduate Medical Association of the University of Pennsylvania School of Medicine, Philadelphia, Dr. George Crile Jr., Cleveland, discussed "Some Changing Trends in General Surgery" and Dr. Tinsley R. Harrison, Birmingham, Ala., presented "Problems in Diagnosis of Chest Pain." The Borden undergraduate research award in medicine ($500 for the student performing the most meritorious research) was won by Foster K. Redding, Decatur, Ill., for his research project and explanatory paper, entitled "A New Method for the Quantitative Recording and Analysis of Tremor; Illustrative Studies with the Use of MK-02 (Merck) in Parkinsonism." Dwight J. Hotchkiss Jr., Drexel Hill, won the Priestley prize with "The Effect of Abdominal Operations Upon the Serum Amylase and Serum Lipase." Frederick W. Pitts, Pittsburgh, was awarded the Mary Ellis Bell prize for "A Comparative Study of the Penrose Drains and Drains of Teflon." The Nu Sigma Nu fraternity prize was jointly won by Charles C. Wolferth Jr., Merion, and Andrew Boyd Jr., Milwaukee. The title of their paper was "Polarigraphic Studies of Circulation in the Dog." John E. Bevilacqua, Philadelphia, G. Lynn Krause Jr., St. Louis, and Robert E. Botti, Somerville, N. J., were jointly awarded the John C. Clark prize for their project, entitled "Deposition Sites of Intravenous Lipid Emulsions." Frank L. Weakley, El Centro, Calif., won the Rose Meadow Levinson memorial prize for his paper, entitled "A Method of Isolating a Segment of Colon of the Rat for the Local Application of Carcinogens: The Operation and Some Preliminary Results of Carcinogen Application."

Philadelphia

Personal.—Dr. Harry E. Banghart has been elected chief of service, department of medicine, Germantown Dispensary and Hospital.——Dr. Albert P. Seltzer, assistant professor of otolaryngology at the Graduate School of Medicine, University of Pennsylvania, gave the commencement address at Shaw University, Raleigh, N. C., May 31.

Institute of Neurological Sciences.—The new Institute of Neurological Sciences at the University of Pennsylvania School of Medicine is scheduled to begin functioning July 1. The institute will provide a center for basic training in the various disciplines of neurological science, such as neuroembryology, neuroanatomy, neurophysiology, neurochemistry, and experimental psychology. Instruction will be chiefly by means of biweekly seminars, supplemented by experiments and by rotation training in research in at least two of the five neurological disciplines represented. The educational and research facilities of the institute will be open to a limited number of adequately prepared candidates for the degree of doctor of philosophy, to certain qualified medical students, and to postdoctoral investigators (Ph.D. or M.D.) wishing advanced training for a research or clinical career. A number of fellowships, with stipends ranging from $1,200 to $1,800 (tuition and fees provided), are available for graduate students accepted by the institute. Funds are provided to help defray the costs of attending one scientific meeting a year. Fellowships are also available for postgraduate investigators (Ph.D. or M.D.), the stipends to be arranged according to need. Research for the thesis can be done with any member or consulting member of the institute or in certain cases with various members of universities other than the University of Pennsylvania. The degree will be awarded by the department in which the thesis work is done, not by the institute.

TENNESSEE

Course in Emergency Surgery.—A postgraduate program in emergency surgery and acute injuries, under the direction of Dr. Harwell Wilson, chief of the division of surgery, will be offered by the University of Tennessee College of Medicine, Memphis, July 28-30, in cooperation with the John Gaston Hospital. Lectures will be given in the recently air-conditioned University Center. For information, communicate with the Postgraduate Department, 4 South Dunlap, Memphis.

TEXAS

Course on Poliomyelitis.—Under the sponsorship of Baylor University College of Medicine, Southwestern Poliomyelitis Respiratory Center, and Jefferson Davis Hospital in Houston, a three day and two evening course, July 13-15, which will include lectures, demonstrations concerning the treatment of poliomyelitis, case conferences, and participation in patient management, is being offered to physicians and ancillary personnel. Arrangements can be made for a selected number of nurses, medical social workers, and physical and occupational therapists to stay two weeks or one month for additional work in their particular areas of interest. Address inquiries to Dr. William A. Spencer, Medical Director, Southwestern Poliomyelitis Respiratory Center, 1801 Buffalo Drive, Houston 3.

WEST VIRGINIA

New Hygienic Laboratory.—The new state hygienic laboratory in South Charleston will be dedicated June 26. The principal address will be delivered by Dr. Thomas F. Sellers, Atlanta, Ga., director of the Georgia Department of Public Health. The laboratory, located on the site of the former West Virginia Medical Center in South Charleston, was turned over to the state by the federal government shortly before the center was closed. Actual construction was begun in May, 1953, and the building has just been completed at a cost of about half a million dollars. Of this amount, the government appropriated $312,000 under the Hill-Burton Act, and the federal grant was matched with an appropriation of $200,000 made by the legislature in West Virginia in 1951.

GENERAL

Postdoctoral Fellowships in Science.—The National Science Foundation has awarded 79 one year postdoctoral fellowships for advanced study and research in the natural sciences for the academic year 1954-1955. The fellowships carry a stipend of $3,400 with additional allowances for dependents, tuition, and other normal expenses. Results of research carried out by a fellow during his training may be made available to the public without restriction, except as required in the interest of national security. An announcement concerning the foundations postdoctoral fellowships for 1955-1956 will be made about Oct. 1, at which time application forms will be available.

Research in Blood Diseases.—The Hematology Research Foundation invites applications for the Ruth Berger Reader fellowship for research in blood diseases in the academic year 1954-1955. The stipend for the fellowship is $1,500 per year with option to renew. The offer is made to workers of any race, creed, or color in the United States. The foundation also invites applications for grants-in-aid for the purpose of hematological research for the period of one year. Nine copies of application must be submitted no later than July 15 to Hematology Research Foundation, 64 W. Randolph St., Chicago 1. (Application forms are available on request.) Awards will be announced by the Medical Advisory Council the latter part of July. The council will choose the applicant on the basis of merit and will also choose the institution in Chicago in which the work is to be done.

Physical Therapists Meet.—The 31st annual conference of the American Physical Therapy Association will be held at the Hotel Statler in Los Angeles, from June 27 to July 2. On Tuesday afternoon Dr. Anthonie van Harreveld, Pasadena, Calif., will discuss "Peripheral Motor Mechanisms." On Wednesday morning Dr. Ernest Bors, Long Beach, Calif., will present "Sequelae

of Cord Injuries." On Thursday there will be a panel discussion on respiratory problems in poliomyelitis, during which Dr. John E. Affeldt, Los Angeles, will discuss "Home Care and Medical Complications of Respirator Poliomyelitis Patients"; Dr. Elizabeth S. Austin, Los Angeles, "Respiratory Problems in Acute Poliomyelitis Patients"; Dr. Clarence W. Dail, Los Angeles, "Weaning the Poliomyelitis Patient from the Respirator"; and Dr. Vernon L. Nickel, Los Angeles, "Orthopedic Considerations of the Poliomyelitis Respirator Patient."

Cardiac Research Awards.—The American Heart Association announces that applications for research fellowships and established investigatorships may be filed up to Sept. 15. The research awards will be available for studies to be conducted during the year beginning July 1, 1955. Research fellowships, awarded for one or two year periods, range from $3,500 to $5,500 and enable younger scientists to train for research careers under experienced supervision. Established investigatorships, awarded for one to five year periods subject to annual review, range from $6,000 to $9,000 and are available to scientists of proven ability who are engaged in a research career. Applications for research grants-in-aid will be accepted up to Dec. 1. Grants-in-aid are awarded in varying amounts, usually not exceeding $10,000, for periods of one to three years, to experienced scientists working in nonprofit institutions on specified research programs. Information and forms may be obtained from the Medical Director, American Heart Association, 44 E. 23rd St., New York 10.

International Symposium on Ophthalmology.—An international symposium on problems in physiology and pathology of the eye will be held in the department of ophthalmology, State University of Iowa College of Medicine, Iowa City, Sept. 24-25. The following program has been announced:

Corneal Thickness: Its Measurement and Changes, Gunnar von Bahr, Uppsala, Sweden (discussion opened by Peter C. Kronfeld, Chicago).

Ophthalmic Problems in Diabetes and Hypoglycemia, Giambattista Bietti, Parma, Italy (discussion opened by George W. Bounds Jr., Iowa City).

Slitlamp Microscopy of the Fundus, Hans Goldmann, Berne, Switzerland (discussion opened by Alson E. Braley, Iowa City).

Ophthalmic Pathology of Fat, Eugene Wolff, London, England (discussion opened by Alfred E. Maumenee, San Francisco).

Optomotor Reflexes, G. B. J. Keiner, Zwolle, Netherlands (discussion opened by Francis Heed Adler, Philadelphia).

Phosphate Metabolism of the Lens, H. K. Müller, Bonn, Germany (discussion opened by Placidus J. Leinfelder, Iowa City).

Periarteritis Nodosa and Related Diseases, J. Boeck, Graz, Austria, (discussion opened by Frederick C. Blodi, Iowa City).

Electroretinography, Harold Henkes, Rotterdam, Netherlands (discussion opened by Hermann M. Burian, Iowa City).

Decline in Infant Mortality.—According to a midcentury report issued by the World Health Organization, the drop in infant deaths averaged about 75% between 1900 and 1953 in the 30 countries and territories studied. During the first quarter of the century, infant deaths dropped by one-third, and during the second quarter, the downward trend reached 50%. Whereas in 1900, of 1,000 children born alive, over 200 died before reaching 1 year of age, the number of victims has been lowered to 20 per thousand in several countries. The countries which had the lowest infant mortality rates at the beginning of the century were also those that had succeeded in cutting these figures most sharply during the past 50 years. In 1900, the infant death rate varied from 264 (per 1,000 live births) in the least fortunate countries, to 75 in the most favored areas. Between 1921 and 1925, infant death rates remained high in the first group of countries (270 per 1,000 live births) but dropped to 43 in the second. However, during the period 1925-1953 and especially after the end of World War II, the trend in infant mortality showed its most important decrease, and this trend spread to a larger number of countries. The record for 1952 shows that in one of the most favored countries, only 2% of the babies die before their 12th month, compared with 16% elsewhere. Although complete returns for 1953 have not yet been received, a partial study of monthly death rates indicates that the downward trend was maintained last year in most countries.

Prevalence of Poliomyelitis.—According to the National Office of Vital Statistics, the following number of reported cases of poliomyelitis occurred in the United States, its territories, and possessions in the weeks ended as indicated:

Area	May 29,1954		May 30, 1953
	Paralytic Type	Total Cases Reported	Total
New England States			
Maine	..	..	1
New Hampshire	..	..	..
Vermont	..	..	..
Massachusetts	..	..	4
Rhode Island	..	..	..
Connecticut	..	..	1
Middle Atlantic States			
New York	..	4	11
New Jersey	No report		1
Pennsylvania	..	1	1
East North Central States			
Ohio	2	12	2
Indiana	..	..	5
Illinois	1	3	2
Michigan	4	8	6
Wisconsin	..	3	2
West North Central States			
Minnesota	..	1	5
Iowa	1	1	3
Missouri	..	5	5
North Dakota	..	..	..
South Dakota	..	..	1
Nebraska	1	1	3
Kansas	1	2	..
South Atlantic States			
Delaware	..	..	..
Maryland	..	..	1
District of Columbia	..	..	1
Virginia	2	4	4
West Virginia	2	4	4
North Carolina	..	..	2
South Carolina	..	2	..
Georgia	5	9	1
Florida	6	21	5
East South Central States			
Kentucky	1	3	3
Tennessee	..	2	7
Alabama	..	12	11
Mississippi	2	6	4
West South Central States			
Arkansas	10	12	2
Louisiana	7	10	5
Oklahoma	3	8	3
Texas	14	48	47
Mountain States			
Montana	..	..	..
Idaho	..	1	..
Wyoming	..	..	..
Colorado	1	1	4
New Mexico	..	2	..
Arizona	..	..	3
Utah	..	..	2
Nevada	No report		..
Pacific States			
Washington	3	4	..
Oregon	1	3	2
California	26	43	33
Territories and Possessions			
Alaska	..	..	..
Hawaii	4	8	1
Puerto Rico	..	..	1
Total	97	244	199

LATIN AMERICA

Meeting on Thoracic Surgery.—The Argentine Society of Thoracic Surgery will conduct the second Argentine Congress of Thoracic Surgery and the seventh Argentine Meeting of Thoracic Surgery, Aug. 17 to 20. Information may be obtained from Dr. Javier Soraiz, secretary of the congress, Caseron 2153, Buenos Aires.

FOREIGN

Society News.—The dates for the International Congress of Hydatid Disease have been changed from Oct. 5-8 to Sept. 25-30. Dr. Jesus Calvo Melendro, Hospital Provincial, Soria, Spain, is secretary general of the congress, which will meet in Madrid.

Congress on Psychology.—The First International Congress for Individual Psychology will take place in Zurich, Switzerland, at the Swiss Federal Technical High School, July 26-29, under

the presidency of Dr. Alexandra Adler, associate clinical professor of neurology, New York University College of Medicine, New York. For information write: Dr. E. Schmid, Krönleinstrasse 14, Zurich, Switzerland.

Congress on Gynecology and Obstetrics.—The International Congress on Gynecology and Obstetrics in Geneva, Switzerland, July 26 to 31, will have as its theme "Prophylaxis in Gynecology and Obstetrics," which will involve discussions of genital tumor growth and protection of the child during pregnancy and delivery. Listed among the main lectures are "The Rise of Preventive Medicine in the World" by Dr. Henry E. Sigerist, research associate in the history of medicine (nonresident) Yale University School of Medicine, New Haven, Conn., and "Material Nutrition During Pregnancy and Its Relationship to Reproductive Failure" by Dr. Josef Warkany, associate professor of pediatrics, University of Cincinnati College of Medicine. Information may be obtained from Dr. H. deWatteville, Maternité Hôpital Cantonal, Geneva, Switzerland, president of the congress.

CORRECTION

National Board of Medical Examiners.—In the last sentence in the right-hand column of page 484 of "Medical Licensure Statistics for 1953" in THE JOURNAL, May 29, it is stated that the National Board test is administered by the Educational Testing Service of Princeton, N. J. In changing the nature of the written examinations to the objective, multiple-choice form, the National Board has maintained full responsibility for the preparation and administration of its own examinations. The National Board has, however, benefited greatly from the cooperation and help of those skilled in the science of testing at the Educational Testing Service.

MEETINGS

AMERICAN MEDICAL ASSOCIATION: Dr. George F. Lull, 535 North Dearborn St., Chicago 10, Secretary.

1954 Clinical Meeting, Miami, Florida, Nov. 29-Dec. 2.

1955 Annual Meeting, Atlantic City, N. J., June 6-10.

1955 Clinical Meeting, Boston, Nov. 29-Dec. 2.

1956 Annual Meeting, Chicago, June 11-15.

ALASKA TERRITORIAL MEDICAL ASSOCIATION, Mt. McKinley Park Hotel, Mt. McKinley Park, Aug. 15-17. Dr. William P. Blanton, P.O. Box 2569, Juneau, Secretary.

NATIONAL MEDICAL ASSOCIATION, Washington, D. C., Aug. 9-13. Dr. John T. Givens, 1108 Church St., Norfolk 10, Va., Executive Secretary.

NEUROSURGICAL SOCIETY OF AMERICA, Grand Hotel, Mackinac Island, Mich., July 21-24. Dr. Lester A. Mount, 700 West 168th St., New York 32, Secretary.

RENO SURGICAL SOCIETY, Reno, Nev., Aug. 19-21. Dr. James R. Herz, 508 Humboldt St., Reno, Nev., Secretary.

WEST VIRGINIA STATE MEDICAL ASSOCIATION, The Greenbrier, White Sulphur Springs, Aug. 19-21. Mr. Charles Lively, P.O. Box 1031, Charleston, Executive Secretary.

FOREIGN AND INTERNATIONAL

BRITISH MEDICAL ASSOCIATION, Glasgow, Scotland, July 1-9, 1954. Dr. A. Macrae, B.M.A. House, Tavistock Square, London, W.C.1, England, Secretary.

COMMONWEALTH HEALTH AND TUBERCULOSIS CONFERENCE, Royal Festival Hall, London, England, June 21-25, 1955. Mr. J. H. Harley Williams, Tavistock House North, Tavistock Square, London, W.C.1, England, Secretary General.

CONFERENCE OF INTERNATIONAL UNION AGAINST TUBERCULOSIS, Madrid, Spain, Sept. 26-Oct. 2, 1954. Secretariat, Escuela de Tisiologia, Ciudad Universitaria, Madrid, Spain.

CONGRESS OF INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF BLINDNESS, New York, N. Y., U. S. A., Sept. 12-17, 1954. Professor Franceschetti, 2 Avenue Mirmot, Geneva, Switzerland, Secretary-General.

CONGRESS OF INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY, Vichy and Paris, France, Sept. 26, 1954. For information write: Dr. Giulio Ammirandoli, Via Della Torretta 11. Montecatini Terme, Italy.

CONGRESS OF INTERNATIONAL SOCIETY OF UROLOGISTS, Athens, Greece, April 1955. Prof. Z. Kairis, 25 rue Voukourestiou, Athens, Greece, Secretary-General.

EUROPEAN SOCIETY OF CARDIOVASCULAR SURGERY, Edinburgh, Scotland, July 9-10, 1954. For information address: Mr. A. J. Slessor, Department of Surgery, University New Building, Edinburgh 8, Scotland.

INTER-AMERICAN CONGRESS OF RADIOLOGY, Shoreham Hotel, Washington, D. C., U. S. A., April 24-29, 1955. Dr. Eugene P. Pendergrass, 3400 Spruce St., Philadelphia 4, Pa., U. S. A., Secretary General.

INTER-AMERICAN SESSION, AMERICAN COLLEGE OF SURGEONS, Universidad Mayor de San Marcos de Lima, Lima, Peru, S. A., Jan. 11-14, 1955. Dr. Michael L. Mason, 40 East Erie St., Chicago 11, Ill., U. S. A., Secretary.

INTERNATIONAL ANESTHESIA RESEARCH SOCIETY, Ambassador Hotel, Los Angeles, Calif., U. S. A., Oct. 10-14, 1954. For information write: Dr. T. H. Seldon, 102-110 Second Avenue S.W., Rochester, Minn., U. S. A.

INTERNATIONAL CANCER CONGRESS, Sao Paulo, Brazil, July 23-29, 1954. Prof. A. Prudente, 171 rua Benjamin Constante, Sao Paulo, Brazil, President.

INTERNATIONAL CONFERENCE ON THROMBOSIS AND EMBOLISM, Basle, Switzerland, July 20-24, 1954. Dr. W. Merz, Chief Medical Officer, Gynecological Clinic, University of Basle, Basle, Switzerland, Hon. Secretary.

INTERNATIONAL CONGRESS OF CLINICAL PATHOLOGY, Washington, D. C., U. S. A., Sept. 6-10, 1954. Dr. Robert A. Moore, Washington University School of Medicine, St. Louis 10, Mo., U. S. A., Chairman, Committee on Arrangements.

INTERNATIONAL CONGRESS ON DISEASES OF THE CHEST, Barcelona, Spain, Oct. 4-8, 1954. Mr. Murray Kornfeld, 112 East Chestnut St., Chicago 11, Ill., U. S. A., Executive Secretary.

INTERNATIONAL CONGRESS ON GROUP PSYCHOTHERAPY, Toronto, Ont., Canada, Aug. 12-14, 1954. Dr. J. L. Moreno, Room 327, 101 Park Ave., New York 17, N. Y., U. S. A., Director of Organizing Committee.

INTERNATIONAL CONGRESS ON GYNECOLOGY AND OBSTETRICS, Geneva, Switzerland, July 26-31, 1954. Dr. H. de Watteville, Maternité Hôpital Cantonal, Geneva, Switzerland, President.

INTERNATIONAL CONGRESS OF HEMATOLOGY, Paris, Sept. 6-11, 1954. Dr. Jean Bernard, 86 rue d'Assas, Paris 6e, France, Secretary.

INTERNATIONAL CONGRESS OF THE HISTORY OF MEDICINE, Rome and Salerno, Italy, Sept. 13-20, 1954. For information write: Segreteria XIV Congresso Internazionale di Storia della Medicina, Instituto di Storia della Medicine, Citta Universitaria, Rome, Italy.

INTERNATIONAL CONGRESS OF HYDATID DISEASE, Madrid, Spain, Sept. 25-30, 1954. Dr. Jesus Calvo Melendro, Hospital Provincial, Sorea, Spain, Secretary General.

INTERNATIONAL CONGRESS FOR INDIVIDUAL PSYCHOLOGY, Zurich Switzerland, July 26-29, 1954. For information write: Dr. E. Schmid, 14, Kronleinstrasse, Zurich, Switzerland.

INTERNATIONAL CONGRESS OF INDUSTRIAL MEDICINE, Naples, Italy, Sept. 13-19, 1954. Professor Scipione Caccuri, Director, Institute of Industrial Medicine Policlinico, Naples, Italy, Chairman, Organizing Committee.

INTERNATIONAL CONGRESS OF INTERNAL MEDICINE, Stockholm, Sweden, Sept. 15-18, 1954. Professor Anders Kristenson, Karolinska Sjukhuset, Stockholm 60, Sweden, Secretary-General.

INTERNATIONAL CONGRESS ON MENTAL HEALTH, University of Toronto, Toronto, Ontario, Canada, Aug. 14-21, 1954. For information write: Executive Officer, International Congress on Mental Health, 111 St. George St., Toronto, Ontario, Canada.

INTERNATIONAL CONGRESS OF NUTRITION, Amsterdam, Netherlands, Sept. 13-17, 1954. Dr. M. van Eekelen, Centraal Instituut voor Voedingsonderzoek T.N.O., 61 Catharynesingel, Utrecht, Netherlands, General Secretary.

INTERNATIONAL CONGRESS OF OPHTHALMOLOGY, University of Montreal and McGill University, Montreal, Canada, Sept. 9-11, 1954, and Waldorf-Astoria, New York, N. Y., U. S. A., Sept. 12-17, 1954. Dr. William L. Benedict, 100 First Avenue Building, Rochester, Minn., U. S. A., Secretary-General.

INTERNATIONAL CONGRESS OF ORTHOPEDIC SURGERY AND TRAUMATOLOGY, Berne, Switzerland, Aug. 30-Sept. 3, 1954. For information write: Professor M. Dubois, Isle-Hospital, Berne, Switzerland.

INTERNATIONAL CONGRESS FOR PSYCHOTHERAPY, Zurich, Switzerland, July 21-24, 1954. Dr. H. K. Fierz, Theaterstrasse 12, Zurich 1, Switzerland, Secretary General.

INTERNATIONAL GERONTOLOGICAL CONGRESS, London and Oxford, England, July 12-22, 1954. Prof. R. E. Tunbridge, General Infirmary, Department of Medicine, The University, Leeds, England, President.

INTERNATIONAL HOSPITAL CONGRESS, Lucerne, Switzerland, May 30-June 3, 1955. Capt. J. E. Stone, International Hospital Federation, 10 Old Jewry, London, E.C.2, England, Hon. Secretary.

INTERNATIONAL INSTITUTE ON CHILD PSYCHIATRY, Toronto, Canada, Aug. 13-14, 1954. Miss Helen Speyer, International Association for Child Psychiatry, 1790 Broadway, New York 19, N. Y., U. S. A., Executive Officer.

INTERNATIONAL POLIOMYELITIS CONGRESS, University of Rome, Orthopedic Clinic, Rome, Italy, Sept. 6-10, 1954. Mr. Stanley E. Henwood, 120 Broadway, New York 5, N. Y., U. S. A., Executive Secretary.

INTERNATIONAL SOCIETY OF BLOOD TRANSFUSION, Paris, France, Sept. 12-19, 1954. For information write: Colonel Julliard, Société Internationale de Transfusion Sanguine, 53 Boulevard Diderot, Paris 12°, France.

INTERNATIONAL SOCIETY FOR CELL BIOLOGY, Leiden, Netherlands, Sept. 1-7, 1954. Professor Peter J. Gaillard, University of Leiden, Leiden, Netherlands, Secretary.

INTERNATIONAL SOCIETY OF GEOGRAPHICAL PATHOLOGY, Washington, D. C., U. S. A., Sept. 6-10, 1954. Professor Fred C. Roulet, Hebelstrasse 24, Basel, Switzerland, Secretary-General.

IRISH MEDICAL ASSOCIATION, Killarney, Ireland, July 7-10, 1954. Dr. P. J. Delaney, 10, Fitzwilliam Place, Dublin, Ireland, Medical Secretary.

JAPAN MEDICAL CONGRESS, Kyoto University and Kyoto Prefectural Medical College, Kyoto, Japan, April 1-5, 1955. Dr. Mitsuharu Goto, University Hospital, Medical Faculty of Kyoto University, Kyoto, Japan, Secretary General.

LATIN AMERICAN CONGRESS ON GYNECOLOGY AND OBSTETRICS, Sao Paulo, Brazil, July 10-15, 1954. Prof. Dr. Jairo Ramos, av. Brigaderio Luiz Antonio, 278-8° andar, Sao Paulo, Brazil, Chairman of Organizing Committee of Medical Congresses.

LATIN AMERICAN CONGRESS ON MENTAL HEALTH, Sao Paulo, Brazil, July 17-22. For information address: Professor A. C. Pacheco e Silva, Avenida Brigadeiro Luiz Antonio 651, Sao Paulo, Brazil.

MEDICAL WOMEN'S INTERNATIONAL ASSOCIATION CONGRESS, Lake Garda, Italy, Sept. 15-21, 1954. Dr. Ada Chree Reid, 118 Riverside Drive, New York 24, N. Y., U. S. A., President.

PAN AMERICAN CONGRESS OF GASTROENTEROLOGY, Sao Paulo, Brazil, July 19-24, 1954. For information address: Dr. Jairo Ramos, Avenida Brigadeiro Luiz Antonio 278-8° andar, Sao Paulo, Brazil.

PAN AMERICAN CONGRESS OF PEDIATRICS, Sao Paulo, Brazil, Aug. 1-7, 1954. For information address: Dr. Jairo Ramos, Avenida Brigaderio Luiz Antonio 278-8° andar, Sao Paulo, Brazil.

PAN AMERICAN HOMEOPATHIC MEDICAL CONGRESS, Hotel Gloria, Rio de Janeiro, Brazil, S. A., Oct. 2-13, 1954. Dr. Paul S. Schantz, 103 West Main St., Ephrata, Pa., U. S. A., Executive Secretary.

PAN-PACIFIC SURGICAL CONGRESS, Honolulu, Hawaii, Oct. 7-18, 1954. Dr. F. J. Pinkerton, Suite 7, Young Bldg., Honolulu 13, Hawaii, Director General.

SOUTH AMERICAN CONGRESS OF ANGIOLOGY, Sao Paulo, Brazil, July 1954. For information write: Dr. Rubens Carlos Mayall, Rua Senador Vergueiro 73, Rio de Janeiro, Brazil, S. A.

WORLD CONGRESS OF CARDIOLOGY, Washington, D. C., U. S. A., Sept. 12-18, 1954. Dr. L. W. Gorham, 44 East 23d St., New York 10, N. Y., U. S. A., Secretary-General.

WORLD CONGRESS OF INTERNATIONAL SOCIETY FOR THE WELFARE OF CRIPPLES, Scheveningen-The Hague, Netherlands, Sept. 13-17, 1954. Secretariat: Miss H. P. Post, Pieter Lastmarkade 37, Amsterdam Z, Netherlands.

WORLD FEDERATION OF OCCUPATIONAL THERAPISTS, Edinburgh, Scotland, August 17, 1954.

WORLD MEDICAL ASSOCIATION, Rome, Italy, Sept. 26-Oct. 2, 1954. Dr. Louis H. Bauer, 345 East 46th St., New York 17, N. Y., U. S. A., Secretary-General.

EXAMINATIONS AND LICENSURE

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II*. Held in approved medical schools where there are five or more candidates. Dates: Sept. 7-8 (Part I only). Candidates may file examinations at any time but the National Board must receive them at least six weeks before the date of the examination they wish to take. New candidates should apply by formal registration; registered candidates should notify the board by letter. Sec., Dr. John P. Hubbard, 133 S. 36th St., Philadelphia 4.

BOARDS OF MEDICAL EXAMINERS

ARIZONA:* *Examination and Reciprocity*. Phoenix, July 14-16, Oct. 13-15, Jan. 12-14, 1955 and April 13-15, 1955. Ex. Sec., Mr. Robert Carpenter, 401 Security Bldg., Phoenix.

CALIFORNIA: *Written*. San Diego, Aug. 23-26; Sacramento, Oct. 18-21. *Oral*. San Diego, Aug. 21; Los Angeles, Nov. 20. *Oral and Clinical Examination for Foreign Medical School Graduates*. Sec., Dr. Louis E. Jones, 1020 N Street, Sacramento.

CONNECTICUT:* *Regular. Examination*. Hartford, July 13-14. Sec., Dr. Creighton Barker, 160 St. Ronan St., New Haven. *Homeopathic*. Derby, July 13-14. Sec., Dr. Donald A. Davis, 38 Elizabeth St., Derby.

DELAWARE: *Examination*. Dover, July 13-15. *Reciprocity*. Dover, July 22. Sec., Dr. J. S. McDaniel, 229 South State St., Dover.

GUAM: The Commission on Licensure will meet whenever a candidate appears or submits his credentials. Director of Medical Services, Guam Memorial Hospital, Agana.

HAWAII: *Examination*. Honolulu, July 12-15. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

IDAHO: *Examination and Endorsement*. Boise, July 12-14. Sec., Mr. Armand L. Bird, 364 Sonna Bldg., Boise.

ILLINOIS: *Examination and Reciprocity*. Chicago, Oct. 5-7. Supt. of Registration, Mr. Frederic B. Selcke, Capitol Bldg., Springfield.

MAINE: *Examination and Endorsement*. Augusta, July 13-14. Sec., Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: *Examination*. Boston, July 13-16. Sec., Dr. Robert C. Cochrane, Room 37, State House, Boston.

MINNESOTA:* *Examination and Reciprocity*. Minneapolis, Oct. 19-21. Sec., Dr. E. M. Jones, 230 Lowry Medical Arts Bldg., St. Paul 2.

MONTANA: *Examination and Reciprocity*. Helena, Oct. 4. Sec., Dr. S. A. Cooney, 214 Power Block, Helena.

NEVADA:* *Examination and Endorsement*. Reno, July 6. Sec., Dr. George H. Ross, 112 North Curry St., Carson City.

NEW HAMPSHIRE: *Examination and Reciprocity*. Concord, Sept. 8-9. Sec., Dr. John S. Wheeler, 107 State House, Concord.

NEW MEXICO:* *Examination and Reciprocity*. Santa Fe, Oct. 11-12. Sec., Dr. R. C. Derbyshire, 227 E. Palace Ave., Santa Fe.

NEW YORK: *Examination*. Albany, New York, Syracuse and Buffalo, June 29-July 2. Sec., Dr. Stiles D. Ezell, 23 S. Pearl St., Albany 7.

NORTH CAROLINA: *Reciprocity*. Blowing Rock, July 30. Sec., Dr. Joseph J. Combs, Professional Building, Raleigh.

NORTH DAKOTA: *Examination*. Grand Forks, July 7-9. *Reciprocity*. Grand Forks, July 10. Sec., Dr. C. J. Glaspel, Grafton.

OREGON:* *Examination*. Portland, July 8-9. *Reciprocity*. Portland, July 9-10. Ex. Sec., Mr. Howard I. Bobbitt, 609 Failing Bldg., Portland.

PENNSYLVANIA: *Examination*. Philadelphia and Pittsburgh, July 13-15. Acting Sec., Mrs. Margaret G. Steiner, Box 911, Harrisburg.

RHODE ISLAND:* *Examination*. Providence, July 1-2. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA:* *Examination*. Vermillion, July 20-21. Reciprocity can be obtained at any time between meetings of board. Executive Secretary, Mr. John C. Foster, 300 First National Bank Bldg., Sioux Falls.

UTAH: *Examination*. Salt Lake City, July 7-9. Director, Mr. Frank E. Lees, Department of Business Regulation, 314 State Capitol, Salt Lake City.

WASHINGTON: *Examination*. Seattle, July 12-14. *Reciprocity*. Seattle, July 11. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

WEST VIRGINIA: *Examination and Reciprocity*. Charleston, July 12-14. Sec., Dr. N. H. Dyer, State Office Bldg., Charleston.

WISCONSIN:* *Examination and Reciprocity*. Milwaukee, July 13-15. Sec., Dr. Thomas W. Tormey, Jr., State Office Bldg., Madison 2.

ALASKA:* On application. Sec., Dr. W. M. Whitehead, 172 South Franklin St., Juneau.

HAWAII. *Examination*. Honolulu, July 12-15. Sec., Dr. I. L. Tilden, 1020 Kapiolani St., Honolulu.

PUERTO RICO: *Examination*. San Juan, Sept. 7-11. Sec., Dr. Joaquin Mercado Cruz, Box 9156, Santurce.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ALASKA: On application. Juneau or other towns in Territory as decided by Board. *Reciprocity*. On application. Sec., Dr. C. Earl Albrecht, Box 1931, Juneau.

COLORADO: *Examination*. Denver, Sept. 8-9. Sec., Dr. Esther B. Starks, 1459 Ogden St., Denver 18.

MICHIGAN: *Examination*. Detroit and Ann Arbor, Oct. 8-9. Sec., Mrs. Anne Baker, Mason Bldg., Lansing 2.

NEBRASKA: *Examination*. Omaha, Oct. 5-6. Director, Mr. Husted K. Watson, Room 1009, State Capitol Bldg., Lincoln 9.

NEW MEXICO: *Examination*. Santa Fe, July 18. Sec., Mrs. Marguerite Cantrell, P. O. Box 1522, Santa Fe.

OKLAHOMA: *Examination*. Oklahoma City, August 27-28. Sec., Dr. Clinton Gallaher, 813 Braniff Bldg., Oklahoma City.

OREGON: *Examination*. Portland, Sept. 11 and Dec. 4. Sec., Mr. Charles D. Byrne, State Board of Higher Education, Eugene.

RHODE ISLAND: *Examination*. Providence, August 31. Administrator of Professional Regulation, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

TEXAS: *Examination*. October. Location to be determined by the number of applications from each section of the state. Sec., Brother Raphael Wilson, 407 Perry-Brooks Bldg., Austin.

WASHINGTON: *Examination*. Seattle, July 7-8. Sec., Mr. Edward C. Dohm, Department of Licenses, Olympia.

WISCONSIN: *Examination*. Madison, Sept. 24. Milwaukee, Dec. 4. Sec., Mr. W. H. Barber, 621 Ransom St., Ripon.

*Basic Science Certificate required.

DEATHS

Tinker, Martin Buel Sr. ⊕ Ithaca, N. Y.; born in Granville, Mass., March 17, 1869; Jefferson Medical College of Philadelphia, 1893; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, 1899; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; past president of the Medical Society of the State of New York and the Tompkins County Medical Society; member of the New York Academy of Sciences, American Surgical Association, American Association for the Advancement of Science, Société International de Chirurgie, Deutsche Gesellschaft für Chirurgie, American Goiter Association, Sigma Xi, Alpha Omega Alpha, Nu Sigma Nu, Pi Gamma Mu, and Phi Kappa Tau; served as a delegate to the International Goiter Conference; during World War I served as a lieutenant colonel in the U. S. Army Medical Corps and was chief of the surgical service in the reconstruction hospital then located at Fort Des Moines, Iowa; assistant in hygiene and physiology at Harvard from 1894 to 1896; demonstrator in anatomy and surgery at Jefferson Medical College, Philadelphia, from 1897 to 1900; lecturer in surgery at Cornell University from 1903 to 1908, when he became assistant professor, serving until 1910; affiliated with Willard (N. Y.) State Hospital, Tompkins County Memorial Hospital, and the Cornell University Infirmary; died in Boston Feb. 26, aged 84, of intestinal obstruction.

Odell, Henry Edward ⊕ Captain, U. S. Navy, retired, Carmel, Calif.; born Dec. 31, 1871; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895; appointed an assistant surgeon with the relative rank of ensign on June 2, 1898; promoted through the ranks to captain, Medical Corps, U. S. Navy, to rank from June 30, 1924, and was placed on the retired list of officers of the Navy on Jan. 1, 1936; on June 1, 1943, recalled to active duty and served until April 6, 1945; commanded the naval hospitals at Guam, Marianas Islands, Canacao, Philippine Islands, Yokohama, Japan, Great Lakes, Ill., and Pensacola, Fla.; served two tours of duty as district medical officer, 12th Naval District, and one tour as district medical officer, 5th Naval District; in addition during his more than 37 years of naval service, served in the United States ships Omaha, Melville, Charleston, Solace, Philadelphia, Ranger, Wheeling, Adams, Galveston, and Wisconsin, as well as at the naval hospitals at Cavite, Mare Island, Norfolk, New York, Newport, and Washington, D. C.; in 1918 member of the House of Delegates of the American Medical Association; died in the Naval Hospital, Oakland, April 29, aged 82, of cardiac asthma and edema.

Rauschkolb, John Edward ⊕ Cleveland; born in Columbus, Ohio, Oct. 19, 1895; Western Reserve University School of Medicine, Cleveland, 1923; assistant clinical professor of dermatology and syphilology at his alma mater; specialist certified by the American Board of Dermatology and Syphilology; secretary-treasurer of the American Academy of Dermatology and Syphilology; member of the American Dermatological Association; fellow of the American College of Physicians; past president of the Cleveland Academy of Medicine; served in the National Guard on the Mexican border, and overseas during World War I with the 37th division; received the decoration of the Silver Star; affiliated with Evangelical Deaconess Hospital, City Hospital, and St. Alexis Hospital; died in the Hanna House of the University Hospitals of Cleveland April 28, aged 58, of electrolyte imbalance and acute glomerulonephritis.

Smith, Wilburn H. ⊕ Burbank, Calif.; born in Thamesville, Ontario, Canada, Feb. 21, 1880; American Medical Missionary College, Battle Creek, Mich., and Chicago, 1905; Jefferson Medical College of Philadelphia, 1907; L.R.C.P. of London, M.R.C.S. of England, 1911; fellow of the American College of Surgeons; emeritus professor of obstetrics and gynecology at College of Medical Evangelists; member of the California Board of Medical Examiners from 1924 to 1928; served on the staffs of the White Memorial Hospital, Presbyterian Hospital-Olmsted Memorial, Los Angeles County General Hospital, and California Hospital in Los Angeles; on the staff of the Glendale (Calif.) Sanitarium and Hospital, where he died April 6, aged 74.

Witter, Frank Clarence ⊕ Highland Park, Mich.; born in Lawrence, Mich., Jan. 26, 1879; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1906; specialist certified by the American Board of Surgery; fellow of the American College of Surgeons; a long-time member and past president of the Detroit Academy of Surgery and the Detroit Obstetrical and Gynecological Society; for 30 years chief of the surgical department and in 1950 president of the staff of the Highland Park General Hospital, where in 1946, on the 25th anniversary of the hospital, a life-size portrait of him was presented, which hangs in the main lobby; died May 8, aged 75.

Mills, Chester Rudolph ⊕ Boston; born in Needham, Mass., April 12, 1893; Harvard Medical School, Boston, 1919; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology and the New England Otolaryngological Society; served overseas during World War I; clinical professor of otolaryngology at Tufts College Medical School; affiliated with Boston City Hospital and Faulkner Hospital in Boston and Newton-Wellesley Hospital in Newton Falls; on the staff of the Glover Memorial Hospital in Needham, where he died April 12, aged 61, of myocardial infarct.

Carter, James Charles ⊕ Indianapolis; Harvard Medical School, Boston, 1913; specialist certified by the American Board of Pediatrics; member of the American Academy of Pediatrics; served during World War I; from 1936 to 1941 on the state division of public health liaison committee to deal with the Social Security Act and a subcommittee to study maternal morbidity and mortality rates for Indiana; from 1942 through 1946 on the advisory committee to the Bureau of Maternal and Child Health, Indiana State Board of Health; affiliated with Methodist and St. Vincent's hospitals; died March 20, aged 68, of coronary occlusion.

Stanton, Donald Ion ⊕ Colonel, U. S. Army, retired, Bradenton, Fla.; born in 1890; Chicago College of Medicine and Surgery, 1917; commissioned in the Army Medical Corps in 1917; at the time of his retirement on Nov. 30, 1949, surgeon of the Fifth Corps at Fort Bragg, N. C.; during World War I served one year with the 33rd division in France and was decorated with the Silver Star medal for gallantry in action; during World War II section surgeon of the Trinidad section and base command for 13 months; on his return to the states was surgeon at Fort Devens, Mass.; died May 9, aged 64, of coronary occlusion.

Abrams, Wilmer David ⊕ Mansfield, Ohio; University of Pennsylvania School of Medicine, Philadelphia, 1919; at one time a fellow in surgery at Mayo Foundation in Rochester, Minn.; affiliated with Mansfield General Hospital; died April 21, aged 62, of cerebral hemorrhage.

Bell, Arlis Green ⊕ Wrightsville, Ga.; University of Georgia School of Medicine, Augusta, 1943; member of the American Academy of General Practice and the Florida Medical Association; served during World War II; died April 16, aged 33, of injuries received in an automobile accident.

Bergman, Sam, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1931; affiliated with Eye, Ear, Nose and Throat Hospital and the Touro Infirmary, where he died April 16, aged 45, of leiomyosarcoma of small intestine with metastases.

Brandon, John Patrick ⊕ Essex, Mo.; University of Tennessee Medical Department, Nashville, 1900; St. Louis College of Physicians and Surgeons, 1903; past member and president of local school board; affiliated with Brandon Hospital in Poplar Bluff, where he died April 18, aged 74, of acute nephritis with arteriosclerosis.

⊕ Indicates Member of the American Medical Association.

Cramer, Leona Lemon, Sharon, W. Va.; College of Physicians and Surgeons, Baltimore, 1915; died in Charleston April 24, aged 63, of bronchogenic carcinoma.

Cratty, Alfred Reed ⊕ Pittsburgh; University of Pittsburgh School of Medicine, 1910; died in Mercy Hospital April 30, aged 89.

Estrem, Theodore Adolph ⊕ Hibbing, Minn.; Rush Medical College, Chicago, 1919; examiner for the Selective Service during World War II; affiliated with Hibbing General Hospital; died April 8, aged 69, of generalized carcinomatosis.

Evans, Raymond ⊕ Champaign, Ill.; Chicago College of Medicine and Surgery, 1915; died in Burnham City Hospital Feb. 1, aged 65.

Fitzgerald, William Weir ⊕ Yonkers, N. Y.; McGill University Faculty of Medicine, Montreal, 1931; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; affiliated with Grasslands Hospital in Valhalla, Yonkers (N. Y.) General Hospital, and Saranac Lake (N. Y.) Hospital; consulting ophthalmologist, Veterans Administration Hospital in Surmount; died April 20, aged 49, of cerebral vascular accident.

Gianfranceschi, Guido James ⊕ Watertown, N. Y.; University of Buffalo School of Medicine, 1911; served during World War I; formerly county jail physician; member of the medical staff of House of the Good Samaritan and the Mercy Hospital, where he was president of the medical staff and member of the board of trustees; died in Veterans Administration Hospital, Buffalo, April 12, aged 69, of cerebral arteriosclerosis and paralysis agitans.

Gillentine, William Howard ⊕ New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1932; served on the faculty of his alma mater; certified by the National Board of Medical Examiners; specialist certified by the American Board of Internal Medicine; fellow of the American College of Physicians; in 1947 president of the New Orleans Graduate Medical Assembly; affiliated with Charity Hospital of Louisiana, Southern Baptist Hospital, and Touro Infirmary; died in Bay St. Louis, Miss., April 16, aged 45, of rupture of the aorta.

Gonzalez-Martinez, Isaac F. ⊕ San Juan, Puerto Rico; Universidad de Barcelona Facultad de Medicina, Spain, 1897; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society, American College of Radiology, and the American Public Health Association; served as president of the Puerto Rico chapter of the Pan American Medical Association; died April 20, aged 82, of coronary thrombosis.

Gourley, William Weir, Downers Grove, Ill.; L.R.C.P. of Ireland and L.R.C.S. of Ireland, 1888; died in St. Charles Hospital, Aurora, April 23, aged 89, of terminal aspiration pneumonia after a fracture of the femur.

Greaves, Joseph Ainsworth ⊕ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; died April 18, aged 80, of carcinoma of the colon with metastases.

Guy, John Milton ⊕ Danville, Ill.; Rush Medical College, Chicago, 1886; died in Kankakee (Ill.) State Hospital recently, aged 93.

Hardesty, Thaddeus H., St. Mary, Ky.; Kentucky School of Medicine, Louisville, 1894; served during World War I; died April 27, aged 91.

Hess, A. Philip ⊕ Chicago; Rush Medical College, Chicago, 1928; on the staff of the Evangelical Hospital; died in the Albert Merritt Billings Hospital April 23, aged 50, of cardiorespiratory collapse during ethylene and oxygen anesthesia after resection of the pancreas for carcinoma of the pancreas.

Jackson, George Henry ⊕ Plymouth, Mass.; Harvard Medical School, Boston, 1904; school physician for 12 years; chairman of the board of health; died April 15, aged 74, of heart spasm.

Johnson, Hannah Celia ⊕ Seattle; University of Nebraska College of Medicine, Omaha, 1924; died in Loveland, Colo., April 13, aged 75, of cirrhosis of the liver.

Judge, Thomas Halligan ⊕ Friday Harbor, Wash.; Universität Heidelberg Mediziniche Fakultät, Baden, Germany, 1939; on the staff of the Anacortes (Wash.) Hospital; for many years health officer; died April 13, aged 46, of bronchogenic adenocarcinoma with metastasis to bone.

Julian, Cyril Joseph ⊕ Staten Island, N. Y.; Georgetown University School of Medicine, Washington, D. C., 1934; served with the Third Army overseas during World War II; associate in medicine, St. Vincent's Hospital; died April 17, aged 45, of carcinoma.

Kellogg, Clarence William, Santa Barbara, Calif.; Cooper Medical College, San Francisco, 1891; for many years division surgeon for the Southern Pacific Railroad; died April 6, aged 87, of cerebrovascular accident and hypertensive arteriosclerotic heart disease.

Klauber, Edward A. ⊕ Staten Island, N. Y.; Long Island College Hospital, Brooklyn, 1924; served during World War II; affiliated with Richmond Borough Hospital and the Staten Island Hospital; died May 1, aged 55, of a heart attack.

Klein, Armin ⊕ Boston; born in New Bedford, Mass., Aug. 24, 1892; Harvard Medical School, Boston, 1917; specialist certified by the American Board of Orthopaedic Surgery; member of the American Orthopaedic Association and the American Academy of Orthopaedic Surgeons; professor of clinical orthopedic surgery at Tufts College Medical School; formerly instructor of orthopedic surgery at his alma mater; served during World War I; affiliated with Massachusetts General Hospital and Beth Israel Hospital; died April 3, aged 61, of aortic stenosis.

Knapp, Robert Phineas ⊕ Manchester, Conn.; Columbia University College of Physicians and Surgeons, New York, 1911; past president of the American Association of Industrial Physicians and Surgeons, now known as the Industrial Medical Association, of which he was a member at the time of his death; served in France during World War I; on the staff of the Manchester Memorial Hospital; medical director of the Cheney Brothers Silk Manufacturing Company for 34 years; died March 15, aged 68, of congestive heart failure.

Knutson, Gerald Arthur ⊕ Hallock, Minn.; Northwestern University Medical School, Chicago, 1932; recently accepted an appointment to the local board of health; served during World War II; died March 7, aged 47, of embolism.

Kossat, Charles R., Shorewood, Wis.; Milwaukee Medical College, 1900; died in Milwaukee recently, aged 86, of hypostatic pneumonia and generalized arteriosclerosis.

Landers, Thornton A., Whitman, Mass.; Middlesex College of Medicine and Surgery, Cambridge, 1917; served during World War I; for many years member of the board of health; formerly school physician; physician for the town football team; examining physician for the Whitman draft board during World War II; on the staff of the Brockton (Mass.) Hospital, where he died April 13, aged 61, of coronary thrombosis.

Lane, Wilmer G., Cambridge, Ohio; Columbus Medical College, 1886; died April 5, aged 90, of a coronary heart attack.

Lederman, Emanuel David, San Francisco; Columbia University College of Physicians and Surgeons, New York, 1898; died in the Mount Zion Hospital April 30, aged 78, of pulmonary infarction and thrombophlebitis.

McCool, William Emery ⊕ Evansville, Ind.; Rush Medical College, Chicago, 1890; an Associate Fellow of the American Medical Association; fellow of the American College of Surgeons; served on the staffs of Welborn, Deaconess, St. Mary's, and Boehne hospitals; died March 31, aged 85, of chronic myocarditis.

McGowan, Edwin Charles, Long Beach, Calif.; Loyola University School of Medicine, Chicago, 1928; died March 21, aged 52, of coronary thrombosis.

McMullan, Thomas Shelton, Elizabeth City, N. C.; University of Virginia Department of Medicine, Charlottesville, 1888; University of the City of New York Medical Department, New York, 1889; served during World War I; city physician for 20 years; formerly member of the state board of medical examiners; died April 4, aged 85, of heart disease with uremia.

Manning, William Joseph, Cleveland Heights, Ohio; Western Reserve University Medical Department, Cleveland, 1902; member of the American Urological Association; for many years on the staff of St. John's Hospital; died April 20, aged 75, of arteriosclerosis, acute bronchopneumonia, and myocarditis.

Mautner, Emil, Newark, N. J.; College of Physicians and Surgeons, Baltimore, 1903; on the staff of the Irvington General Hospital; died April 10, aged 76, of a heart attack.

Miller, Nesbitt Ludson ⊕ Oklahoma City, Okla.; University of Oklahoma School of Medicine, Oklahoma City, 1927; member of the American College of Allergists; served during World War II; died in the Memorial Hospital, New York, May 3, aged 52, of cancer.

Miller, Walter Bryan, Russell Springs, Ky.; University of Louisville (Ky.) School of Medicine, 1944; served during World War II; affiliated with Somerset (Ky.) City Hospital; died April 19, aged 33, of a heart attack.

O'Neill, Joseph Bernard ⊕ Truckee, Calif.; Washington University School of Medicine, St. Louis, 1932; member of the Missouri State Medical Association; died in Washoe Medical Center, Reno, Nev., April 3, aged 52.

Parmley, Joseph G. ⊕ Marion, Ill.; University of Louisville (Ky.) Medical Department, 1908; for 18 years secretary and for 4 years president of the Williamson County Medical Society; died April 15, aged 77, of arteriosclerosis.

Patterson, Paul Moyer ⊕ Major, U. S. Army, Santa Monica, Calif.; Kansas City (Mo.) Hahnemann Medical College, 1912; served during World War I and received the Distinguished Service Medal; entered the Medical Corps of the U. S. Army as a first lieutenant Jan. 14, 1920; retired July 1, 1926; died April 1, aged 64, of cor pulmonale emphysema and severe chronic asthmatic bronchitis.

Payne, Louis Ernest Jr. ⊕ Toledo, Ohio; Johns Hopkins University School of Medicine, Baltimore, 1917; specialist certified by the American Board of Pediatrics; in 1940 became pediatrician for the city board of health and three years later was named superintendent of the bureau of maternal and child hygiene; affiliated with Toledo and St. Vincent's hospitals and Mercy Hospital, where he died April 15, aged 62, of cerebral thrombosis.

Pilcher, James Douglas, Cleveland Heights, Ohio; Western Reserve University Medical Department, Cleveland, 1905; formerly on the faculty of his alma mater; member of the American Pediatric Society; served during World War I; for many years on the staff of the City Hospital, where he died May 4, aged 74, of metastatic gastric carcinoma.

Pomeroy, Harris Starr ⊕ Lynnfield, Mass.; University and Bellevue Hospital Medical College, New York, 1900; served during World War I; formerly practiced in Peabody, where he was chief surgeon at the J. B. Thomas Hospital; died in Chelsea, April 20, aged 78, of carcinoma of the floor of the mouth and arteriosclerotic heart disease.

Priborsky, Benjamin Harrison ⊕ Detroit; Detroit College of Medicine and Surgery, 1914; specialist certified by the American Board of Obstetrics and Gynecology; served on the staffs of the Providence and Holy Cross hospitals; member of the Detroit Historical Society and the Founders Society of the Detroit Institute of Art; died April 12, aged 62, of massive pulmonary edema.

Prosterman, Frances ⊕ Los Angeles; Loyola University School of Medicine, Chicago, 1921; member of the American College of Allergists; at one time practiced in Chicago, where he was on the staff of the Mount Sinai Hospital; died May 5, aged 65, of coronary thrombosis.

Reuter, John Alexander ⊕ The Dalles, Ore.; Rush Medical College, Chicago, 1897; fellow of the American College of Surgeons; affiliated with The Dalles General Hospital; died April 3, aged 77, of cerebral vascular accident, cerebral arteriosclerosis, and bronchial asthma.

Rogers, Raymond Alward ⊕ Columbus, Ohio; Ohio State University College of Medicine, Columbus, 1920; died in White Cross Hospital April 8, aged 66, of Hodgkin's disease.

Russ, Jesse Eugene ⊕ Rake, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; died in Methodist Hospital, Rochester, Minn., April 5, aged 69, of gastrointestinal hemorrhage and chronic duodenal ulcer.

Schroeder, George Henry ⊕ Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1906; fellow of the American College of Surgeons; served in France during World War I; for many years chief of staff of Lutheran Deaconess Hospital; died April 25, aged 69.

Severac, Marie ⊕ Philadelphia; Université de Paris Faculté de Médecine, France, 1907; an Affiliate Fellow of the American Medical Association; died in the Germantown Hospital April 13, aged 73, of myocardial infarction.

Shaw, Merrill ⊕ Seattle; University of Minnesota Medical School, Minneapolis, 1932; past president of the King County Medical Society; vice-president of the American Academy of General Practice; served during World War II; affiliated with Maynard, Providence, and Doctors hospitals; died April 24, aged 50, of metastatic carcinoma.

Thomas, Samuel Daniel, Carrollton, Ga.; Meharry Medical College, Nashville, Tenn., 1917; on the staff of the Tanner Memorial Hospital; died April 12, aged 67, of a heart attack.

Thompson, Augusta Louise Rosenthal, Spring Lake, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1884; died March 31, aged 94, as the result of a fall.

Thompson, Leonard Martin ⊕ Lena, Ill.; Chicago Medical School, 1921; also a graduate in pharmacy; member of the International College of Surgeons; local surgeon for the Illinois Central Railroad; until recently operated the Lena Community Hospital and the Thompson Clinic; on the board of directors of the Roseland Standard Saving and Loan Company of Chicago; died in St. Mary's Hospital, Rochester, Minn., March 22, aged 59, of carcinoma of the pancreas.

Viskocil, Emil James ⊕ Lockport, Ill.; Loyola University School of Medicine, Chicago, 1929; served as president of the board of education of Lockport Township High School; on the medical staff of St. Joseph's Hospital in Joliet; died April 26, aged 53.

Wade, Francis Aloysius, Morristown, N. J. (licensed in New Jersey in 1938); on the emeritus staff at All Souls Hospital, where he died April 8, aged 68, of acute pulmonary edema due to arteriosclerotic heart disease.

Walker, Emma Elizabeth ⊕ New York City; Johns Hopkins University School of Medicine, Baltimore, 1898; for many years affiliated with the New York Hospital for the Ruptured and Crippled, now the Hospital for Special Surgery; author of "Beauty Through Hygiene" and "Pretty Girl Papers"; died in Montclair, N. J., April 15, aged 90, of carcinomatosis.

Walton, William Joseph ⊕ Boston; Harvard Medical School, Boston, 1897; served as councilor of the Massachusetts Medical Society, and president of the Norfolk District and Dorchester Medical societies; member of the New England Obstetrical and Gynecological Society; fellow of the American College of Surgeons; obstetrician, St. Mary's Lying-In Hospital and St. Margaret's Hospital, where he died March 10, aged 80, of aneurysm of the aorta.

Ware, James Roger ⊕ Huntington, Ind.; Indiana University School of Medicine, Indianapolis, 1939; served during World War II; died April 1, aged 41, of coronary occlusion.

Watson, Benjamin Frank ⊕ Independence, Mo.; Kansas City (Mo.) Medical College, 1895; died April 23, aged 83, of carcinoma of the colon.

Weisfeldt, Louis Armand ⊕ Milwaukee; Rush Medical College, Chicago, 1935; fellow of the International College of Surgeons; affiliated with Mount Sinai, Misericordia, and Doctors hospitals; died April 3, aged 44, of acute coronary occlusion.

White, Henry Bascom, Lake Charles, La.; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; served as head of the city board of health; on the staff of St. Patrick's Hospital; died March 21, aged 76, of prostatic cancer and congestive heart failure.

FOREIGN LETTERS

AUSTRIA

Hexymethylene Biscarbaminoylcholine.—At the meeting of the Society of Physicians in Vienna on Jan. 15, 1954, Dr. H. Brücke reported on the practical use of polymethylene biscarbaminoylcholine in surgery. Hexamethylene biscarbaminoylcholine was given a therapeutic trial in 178 patients. The new preparation proved to be three times as effective as curare and, thus, represents the strongest known skeletal muscle relaxant. Since it is not destroyed in the body but is excreted by the kidneys, the dose-effect curve rises abruptly when the drug is administered in large doses. The critical dosage is about 0.12 to 0.15 mg. per kilogram of body weight. This should be exceeded only if an operation of three or four hours' duration is anticipated. In other cases, it seems advisable to give, from the first, a single dose that should be determined according to body weight and expected duration of the operation. The drug may be combined advantageously with bischolinechloride succinate dihydrate (Lysthenon), the effect of which is short. It proved expedient to administer the total dose at the beginning of the operation to avoid additional injections in the course of the operation, because a prolonged cessation of respiration may occur otherwise. The drug is considered a highly effective and clinically useful skeletal muscle relaxant.

Prostatic Disease.—At the same meeting, Dr. R. Chwalla reported on studies of diffuse hyperplasia and adenoma of the prostate depending on internal secretion. Autopsies were performed in 886 cases of hypertrophy and in 18 cases of diffuse hyperplasia of the prostate. The bodily constitution of the men with these disorders and also that of men with underdevelopment and atrophy of the prostate was studied in order to gain insight in the internal causes of these disorders. For this purpose, a special method was devised by Chwalla, for which the term "constitutional-pathological analysis of the accompanying diseases" was coined. As a result of this analysis, Chwalla stated that testes and adrenals play a decisive part in the pathogenesis of adenoma of the prostate, particularly in that of the diffuse hyperplasia of the prostate. Both conditions may be considered as diseases associated with hyperadrenalism. An increase in the substance of the adrenals was observed on macroscopic examination in one-third of the cases of diffuse hyperplasia and in one-fifth to one-seventh of the cases of hypertrophy of the prostate. The increase depended on the type of the hypertrophy. A significant above average incidence of hypertrophy and of diffuse hyperplasia of the prostate was observed in men with various types of hyperadrenalism and hypertension, in obese men, in pyknic men, and in men with hypertrichiasis, embolism, and emphysema, renal cysts and hypernephromas, or multiple pigmented nevi; and conversely, the relative frequency of hypertension, severe arteriosclerosis, the tendency to thrombosis, embolism, and diabetes—the essential, already known, constitutional-pathological characteristics of men with prostatic disorders—may be explained by their hyperadrenalism. The severest cases of hypertrophy of the prostate, the three-lobed hypertrophies, also had the highest incidence of hyperadrenal disorders.

Sex Differences in the Cornea.—At a meeting of the Society of Physicians of Vienna on Jan. 22, 1954, Dr. A. Pillat discussed sex differences in the cornea. On the basis of earlier investigations by Schulhof and Luger, he reported the results of investigations carried out at the Pathologic Anatomic Institute that seem to permit differentiation between male and female corneas. All layers of the female cornea show parallelism of the connective tissue bundles. In one specimen discussed, this parallelism was further emphasized by the parallel arrangement of the fixed corneal bodies. In female corneas, the connective tissue bundles show branching only relatively rarely, and, if they do branch, the transition from one bundle to the next shows a very acute angle. The male cornea shows a certain irregularity in the structure of the connective tissue bundles, because the individual fiber bundles are less parallel, many of the bundles being connected with one another and these interlacings showing varying angles and sometimes wave forms. The entire cornea must be studied and evaluated, not merely a small field. In the course of the studies, it was noted that sex differentiation of the cornea is possible only in specimens from persons between the ages 15 and 55. In children and in the aged, a differentiation is either impossible or the investigator will make more incorrect than correct identifications.

BRAZIL

Mechanism of the Ileocecocolic Pylorus.—Drs. Liberato Di Dio and Célio Fontão Carril of São Paulo have studied the mechanism of the ileocecocolic pylorus in a 26-year-old man whose cecum was exteriorized and had a defective wall (*Rev. brasil. gastroenterol.* **6**:67 [January-February] 1954). Reported direct observations of the ileocecocolic eminence, through the opened wall of the large intestine, showed the constancy of papillar morphology without cecocolic frenula. The terminal ileum showed an average of 13 to 14 rhythmic contractions per minute. An intravenous injection of 10 cc. of a 30% solution of sodium chloride resulted in a marked increase in tonus, followed by the expulsion of the rubber balloon introduced into the terminal ileum. An intravenous injection of 1 cc. of neostigmine (Prostigmin) also caused a marked increase in tonus. Faradic electric excitation produced only a slight increase in tonus. The ileal emptying reflex was noted twice several minutes after the initial swallows. During and after spinal anesthesia that was followed by an injection of 20 mg. of morphine, no change could be seen in the ileocecocolic papilla—only rhythmic pulsations corresponding to arterial pulsation. After surgical reconstitution reestablishing intestinal wall continuity, x-ray examinations revealed "jejunization" of the whole small intestine, a hyperkinetic ileocecocolic region, a permanent contraction zone immediately over it, a deformed cecum, and accelerated flow without obstacles at the ileocecocolic junction. Phases of opening and closing of the ileocecocolic ostium, as well as the ileal ampulla in kinetic rest, could also be seen. Three months after the operation, the patient had no complaints. The mechanism of the ileocecocolic junction depends fundamentally on the opening and closing musculature of the ileocecocolic pylorus.

Chagas' Disease.—During recent years, there has been increasing interest in schizotrypanosis as a medicosocial problem affecting extensive rural areas of the state of Minas Gerais. Dr. J. Pellegrino in *Memórias do Instituto Oswaldo Cruz* for December, 1953, reported investigations carried out among patients and blood donors in some hospitals of Belo Horizonte; epidemiological data about the geographical distribution of domiciliary vectors of the disease; work on cardiopathy in patients with chronic Chagas' disease; various experimental and serological studies; researches on the cytogenetics of triatomids; and the application of modern prophylactic methods in controlling a focus of schizotrypanosis near Belo Horizonte. In view of the excellent results obtained in laboratory and field experiments carried out in Bambí, Santa Juliana, and Uberaba, Minas Gerais with the use of residually acting insecticides against the domiciliary vectors of schizotrypanosis, the National Malaria Service started, in May, 1950, the first large-scale prophylactic campaign in Brazil. The region chosen for this included 123 counties in Minas Gerais and 93 in São Paulo, an area of about 213,000 square kilometers with about 200,000 houses to be treated. All

The items in these letters are contributed by regular correspondents in the various foreign countries.

the houses infested with triatomids in the malarial districts of Minas Gerais were treated with residually acting insecticides. Later, and as far as possible, this type of protection will be extended to other regions in central Brazil where preliminary inquiries showed the existence of insect vectors of schizotrypanosis.

Transfusion Reaction Due to Kell Factor.—Drs. F. Ottensooser and Paulo Taunay reported transfusion reaction caused by Kell factor in *Revista paulista de medicina* for January, 1954. A patient with B MN Rh_2 Kell negative blood was given, in the 19th or 20th transfusion, B MN Rh_1rh Kell-positive blood, which caused a hemolytic reaction. Her serum contained Kell antibody, identified by comparison with another Kell serum formerly obtained. The frequency of the Kell factor in São Paulo was determined with one of the two serums or both. Of 426 persons, 39 (or 9.1%) reacted positively. The frequency of the corresponding gene K is 0.043, according to research performed in the São Paulo blood bank and the Laboratorio paulista de biologia. The authors concluded that the Kell factor is of great clinical importance. Whereas the major incompatibilities by A, B, and Rh groups are now usually well controlled in giving transfusions, the minor incompatibilities caused by the Kell and other factors not so well understood will lead to an increase in transfusion reactions. These minor incompatibilities are in some cases discovered by cross matching, but in others Coombs' and enzyme tests are required.

Scientific and Cultural Congress.—A long series of medical activities has been organized to commemorate São Paulo's fourth centennial to run throughout 1954. The International Congress of Surgeons met in April; the Inter-American Congress on Ophthalmology, June 11 to 17; Brazilian Congress on Sociology, June 21 to 27; Latin-American Congress of Gynecology and Obstetrics, July 10 to 15; Latin-American Congress of Mental Health, July 15 to 20; Pan-American Congress of Gastroenterology, July 17 to 23; Inter-American Congress of Sanitary Engineering, July 25 to 31; International Congress on Cancer, July 23 to 29; Congress on Pediatrics and Child Study, Aug. 1 to 5; International Congress of University Presidents, Aug. 1 to 5; International Congress on Odontology, Oct. 24 to 30; Pan-American Congress on Pharmacy and Biochemistry and the Brazilian Congress on Pharmacy, Dec. 1 to 8.

Spontaneous Pneumothorax.—In the *Revista paulista de medicina* for March, 1954, Dr. Paulo de Vilhena Moraes reported nine cases of spontaneous pneumothorax on the left side. In one patient it was chronic, one had had two recurrences, one had hemopneumothorax, and one also had bilateral pulmonary tuberculosis. The ages of these patients ranged from 18 months to 36 years. Simple, benign or idiopathic spontaneous pneumothorax probably has its origin in a ruptured subpleural cyst or bleb due to congenital or acquired malformations. In most patients the prognosis is favorable. The treatment is symptomatic or preventive. Occasionally repeated aspirations are necessary to hasten the reexpansion of lung. Twelve years ago, Dr. Eurico Branco Ribeiro drew attention to the fact that acute pain in the upper part of the abdominal wall may be produced by spontaneous pneumothorax.

International Congress of Surgery.—The ninth meeting of the International College of Surgeons, which met in São Paulo in April, was attended by representatives of 27 countries. Dr. Max Thorek, founder of the International College of Surgeons, Prof. Dr. Carlos Gama, president of the congress organizing committee, Dr. Oscar Cintra Gordinho, president of the Brazilian section of the International College of Surgeons, Dr. Edward McCormick, 1953-1954 president of the American Medical Association, and Dr. Morris Fishbein were among the speakers. Dr. Francisco Graña of Perú, former president of the International College of Surgeons, acted as president in the absence of Prof. Hans Finsterer of Vienna who could not attend because of illness. The main subjects for discussion were socialization of medical services, antibiotics, and the means of contrast in radiology.

Granuloma Annulare.—Drs. Aurelio Ancona Lopez and Alexandre Mello Filho in the *Arquivos Médicos municipais* for December, 1953, reported two cases of granuloma annulare. Only 12 cases had previously been reported in Brazil. The authors pointed out the necessity for differentiating this disease from erythema elevatum diutinum, necrobiosis lipoidica diabeticorum, and rheumatic nodes. Although tuberculosis is sometimes a cause of this disease, no evidence of tuberculosis was found in these two patients.

Rupture of the Spleen.—Dr Thales de Brito studied 12 spleens removed as surgical emergencies because of traumatic rupture. The site of rupture shows a parenchymal hematoma compressing the surrounding tissue without other damage during the first 12 hours. After this period, necrosis appears in the center of the Malpighian corpuscle, followed later by ischemic necrosis of larger areas in the surrounding parenchyma. The latter changes appeared in less than 12 hours in only one case.

Honors to Sir Alexander Fleming.—For the third time Sir Alexander Fleming has visited Brazil. On his two previous visits he had come to attend medical congresses. This time he came for the opening of a modern penicillin plant built by Fontoura-Wyeth in São Paulo. Sir Alexander and Lady Fleming spent a week in the state of São Paulo, where they visited several cities, and spent a week in Rio de Janeiro.

COLOMBIA

Intestinal Parasitism.—In a review of intestinal parasitism in Colombia (*Rev. Fac. méd.* **22:**101-111, 1953), Dr. L. Patiño Camargo states that the condition constitutes one of the most serious social and economic problems of the country. It is pandemic throughout the republic, with greatest intensity in the regions of tropical and semitropical climates where 88% of the population are infested with one or more of the 22 prevalent species of parasites (Fasciola hepatica, Taenia solium, Taenia saginata, Hymenolepis nana, Hymenolepis diminuta, Dipylidium caninum, Ascaris lumbricoides, Enterobius vermicularis, Strongyloides stercoralis, Ancylostoma duodenale, Necator americanus, Trichiuris trichiura, Endameba coli, Endameba histolytica, Endolimax nana, Iodameba bütschlii, Dientameba fragilis, Retortamonas intestinalis, Chilomastix mesnili, Trichomonas intestinalis, Giardia intestinalis, and Balantidium coli).

Amebiasis is found in about 30% of the inhabitants of all the regions of the country and constitutes a serious problem because of its varied symptomatology, localization, and resistance to treatment. The author stated that no drug can be considered specific for the treatment of amebiasis, even if the given drug is very active and effective in vitro. To obtain favorable results, patience and perseverance in the treatment are indispensable. Repeated stool examinations are necessary. Negative results are of no value, unless they are repeatedly so. Proctoscopy is of value only if careful examination by a proper technique is made. A valuable therapeutic program consists of giving 0.5 gm. of glycoarsenic bismuth (Wintodon) three times daily for four days, then 0.21 gm. of diodoquin six times daily for four days, and then 0.25 gm. of chloroquine three times daily for three days. This treatment is repeated after a four day rest period; then stool examinations are repeated. Emetine hydrochloride may be given to patients with acute dysentery whose stools contain active trophozoites. The drug is given subcutaneously in a dosage of 1 mg. per kilogram of body weight at intervals of 12 hours for two days, after which the drug may be given by mouth. If there is evidence of localization in the liver or other organs, emetine and chloroquine should be given. Emetine may be administered for 10 days if there are no contraindications. Chloroquine is given in daily doses of 1.5 gm. for three days, this followed by daily doses of 0.75 gm. for 10 days. Hepatic abscesses are aspirated by needle, but the treatment with chloroquine and emetine is not interrupted. In patients with amebiasis, open surgery is usually contraindicated.

The prevention of intestinal parasitism includes (1) sanitary measures such as construction of toilets, provision of potable water, isolation of coprophagic animals, and disposal of garbage

in places far removed from human habitation, (2) provision of proper diet to increase the resistance of the people, (3) hygienic dwellings, (4) wearing shoes, and (5) treatment of patients and carriers. All these measures require education of the people.

New Surgical Techniques.—Dr. S. Triana Cortés, chief of the Laboratory of Experimental Surgery, Faculty of Medicine of the National University, reviewed work carried on in his laboratory on transplants of the small intestine (*Rev. Fac. méd.* **22**:113-149, 1953). He described a new technique for diversion of the bile by means of a hepatojejunoduodenostomy in patients with nonfunction of the biliary tract. He also describes the technique for transplantation of an intestinal graft for internal diversion of the feces that obviates the necessity of a colostomy. The author described another operation by which an isolated segment of the cecum is used as a urinary bladder. In this operation, the appendix is exteriorized through the muscles of the abdominal wall that form a pseudosphincter. The cecum is disinfected by lavage through a Nelaton catheter passed through the appendix, and in this process the cylindrical epithelium of the mucosa is transformed into pavement epithelium. By this transformation, the absorption of substances from the urine into the blood is prevented. In the second stage, the ureters are transplanted into the cecum. This operation is indicated in patients with vesicovaginourethral fistula, large vesicovaginal fistula, and cancer of the bladder. Another technique described by the author is the plastic reconstruction of the bile ducts by means of a cholecystojejunoplastic gastrostomy, as performed on 20 dogs. The operation consists of isolating a segment of the first jejunal loop. The pedicle of the segment is preserved, and the lumen is reestablished by means of an end-to-end anastomosis. The proximal end is anastomosed to the gallbladder and the distal end to the stomach or duodenum.

DENMARK

Homologous Serum Jaundice.—At a meeting of the Danish Society for Internal Medicine, Dr. Sten Madsen reported an investigation he carried out at the surgical department A of the Bispebjerg Hospital. All the patients who had been admitted to this hospital in 1951 were asked to answer a questionnaire, 4,687 of them being asked if they had suffered from jaundice before or after admission to this hospital. Among the 4,133 who answered, 78 stated that they had been jaundiced since discharge from hospital. After the elimination of gallstones and cancer as possible causes of jaundice, 17 patients whose jaundice could be ascribed to hepatitis remained. Madsen concluded that, among the patients receiving transfusions in 1951, the incidence of hepatitis was 1% for those who received blood from a single donor and 3.4% for those who received dry serum. It was only 0.14% for the patients not receiving transfusions. One of his main conclusions was that, in the event of a new wave of homologous serum jaundice, it would be important to avoid using donors with a history of jaundice. Furthermore, should jaundice develop in a donor less than a month after acting as such, the persons responsible for the donor's services should be promptly notified of this event. Another study comes from the Frederiksberg Hospital, where Dr. Franz Heintzelmann and Dr. Erik Westengaard scrutinized the records of all the patients who, during the period 1946 to 1952 inclusive, suffered from acute or chronic hepatitis. Among the 30 patients representing readmissions for hepatitis in this period, there were 18 whose infection may have occurred in the hospital. This study yielded no clear-cut findings showing how hospital infections can be avoided by tightening precautionary measures. This somewhat negative conclusion does not, however, apply to diabetic patients for whom better care may well yield better results. The diabetic is, indeed, much in need of such greater care, because he requires many blood tests for every one blood test other patients undergo. The third of these studies (all of them published in *Ugeskrift for Laeger* for April 29, 1954) was undertaken by Drs. O. Aagenaes, H. Bach, and S. E. Budolfsen and concerns an epidemic of homologous serum jaundice. They, too, have learned to focus attention on the diabetic whose proneness to this disease needs to be combated by special measures.

Parapertussis.—The story of parapertussis in Denmark begins with John Miller Jr. of San Francisco, who in 1933 was the guest of the State Serum Institute in Copenhagen, where he isolated from some suspect whooping cough material certain "green strains" about which little was known at the time. In the light of subsequent studies, these strains can now be identified as Bacterium parapertussis, successfully identified for the first time in Denmark in the autumn of 1950. One of its discoverers, Dr. Hans Lautrop, has reported in *Ugeskrift for Laeger* for March 18, 1954, on the work carried out in this field at the State Serum Institute since 1950. Only about 200 cases of parapertussis have been reported, yet, when a search was made for B. parapertussis, as many as 215 such cases were observed during the six months beginning November, 1950. These cases evidently represented an outbreak differing both chronologically and geographically from an outbreak of genuine whooping cough in Copenhagen. Lautrop found that the behavior of B. parapertussis and that of B. pertussis reveals so many definite cultural differences that an experienced bacteriologist should have no difficulty distinguishing between the two. It is, however, impossible to make this distinction on the clinical evidence only, although parapertussis runs a shorter and milder course than genuine pertussis. Thus, while 98 of 100 cases of parapertussis lasted less than six weeks, 92 of 100 pertussis cases lasted longer. Lautrop has seen no deaths from parapertussis, nor does the disease in his experience provoke convulsions or collapse after a bout of coughing, but in about 20% of cases the parapertussis was complicated by otitis media that gave rise to transient earache and diminution of hearing. Agglutination tests reveal specific antibodies in a surprisingly high percentage of the community, rising from 6% in the first year of life to 76% at the age of 11 years. This means that before they have reached the age of 10, most Danish children have had a parapertussis infection. Lautrop calculates that during the epidemic of 1950-1951, at least 50,000 persons must have been infected with B. parapertussis in Denmark alone. Reports from the United States suggest that the infection is as common there as in Denmark. No parapertussis antibodies have, however, been detected in the blood of 100 Greenland children examined.

Cesarean Section.—*The Danish Medical Bulletin* for April, 1954, contains a report by Dr. Per Schou of all the cesarean sections carried out in Denmark in the 10 year period 1941 to 1950. These 2,488 sections were classified in two groups of five year periods each. In the period 1941 to 1945, sections represented 0.2% of all the confinements, the corresponding figure for the second five year period being 0.37%, or nearly double that of the first period. This percentage was only 0.18 in 1941, whereas it was 0.45 in 1950. It is significant that in the middle of the period under review, about 1946, the introduction of penicillin in clinical practice became effective. Schou's comparison of experience with cesarean section in Denmark with that in England, Germany, the United States, Sweden, Norway, and Finland disclosed marked national differences. While in Denmark 250 confinements occurred for each cesarean section, the corresponding figure in adjacent countries was only 110, and whereas the frequency of sections in special maternity departments was 1% in Denmark, the corresponding figures abroad ranged from 2 to 6%, or more. As Schou puts it, "we Danes, seen through foreign eyes, are considered rather conservative in our midwifery." Among Schou's 2,488 patients were 115 who died, 66 in the first and 49 in the second five year period, a fall of maternal mortality from 7.8% in the first period to 3% in the second. In the same 10 year period, there has been a marked fall in the general maternal mortality on delivery in Denmark—from 1.7 per thousand in 1941 to 0.6 in 1950. The commonest indications for section were, in the order of their frequency, placenta praevia, contracted pelvis, and toxemia. It seems that placenta praevia constitutes a relatively more frequent indication for operation in Denmark than in most other foreign countries. Schou deplores the high maternal mortality for section in Denmark, compared with other countries, and he suggests that more effective centralization and specialization may improve matters, for at present, with each surgeon performing cesarean section only two or three times a year on the

average, experience and dexterity may be relatively defective. The comparatively low maternal mortality in the best-equipped maternity clinics seems to support this view.

Tuberculosis Census.—The annual report of the Danish National Association for Combating Tuberculosis for the period ending March 31, 1953, contains an account of a search for new cases of tuberculosis in persons in the age groups 1 to 6 years and 15 to 34 years. Among the 1,088,500 persons examined, 470,822 were tuberculin negative; 444,896 of these persons consented to BCG vaccination. This investigation brought out the significant fact that new cases of tuberculosis have come to be commoner after the age of 35 than before. This upward shift of the age incidence of tuberculosis was such that, under the age of 35, only 5.8 per 10,000 persons examined were found to have tuberculosis, whereas this was the case with 7.1 per 10,000 persons examined after the age of 35. The lesson of this finding is that it would be well in the future to raise the age limit beyond 35 when widespread surveys are undertaken in a search for new cases of tuberculosis.

ENGLAND

Penicillin.—Two recent reports indicate the growing interest in penicillin for oral use, especially in children. Fairbrother and Daber (*Lancet* **1**:858, 1954) compare the insoluble benzathine penicillin (Penidural) with the soluble potassium penicillin G (Eskacillin) and the potassium salt of benzylpenicillin (Pradupen). A single dose of 300,000 to 600,000 units of benzathine penicillin was given to 181 patients (150 adults and 31 children). In adults, a dose of 300,000 units "gave disappointing results and was discontinued." With a dose of 600,000 units, a detectable serum penicillin level was found within three hours in 67 of 68 assays, and in six patients a level of 0.5 unit or more per milliliter was obtained. After five or six hours, 37 of 59 persons still had levels of 0.06 unit or more per milliliter. The results in children were more satisfactory. All had detectable serum-penicillin levels after a dose of 300,000 units; a dose of 600,000 units did not produce any increase in the serum penicillin levels. Eleven men with acute gonorrhea were treated with benzathine penicillin. Two of these each received a dose of 600,000 units, and both showed immediate improvement and then had a relapse. Nine were given two doses of 600,000 units six hours apart; seven were cured and two had a relapse. The two soluble compounds were given to 142 adults. With a dose of 300,000 units, serum penicillin levels were irregular, but in a few patients levels of 1 unit or more per milliliter were attained, and in only one was there no evidence of absorption. Results were better with a dose of 600,000 units. All of 58 patients gave evidence of absorption at the peak period, and with Eskacillin some penicillin was still present at the end of four to six hours. Of 15 men with acute gonorrhea who were given two doses of 600,000 units six hours apart, all showed rapid improvement.

The second report, by Beasley and MacPherson (*Lancet* 1:861, 1954), is based on the findings in 131 children. Benzathine penicillin was given in single doses of 5, 10, 15, and 20 ml. (5 ml. equals 300,000 units of penicillin) to children in different weight groups, and serum penicillin levels were estimated at regular intervals up to 6, 8, or 12 hours after its administration. The minimal satisfactory serum penicillin level was taken as 0.03 unit per milliliter. It was found that 300,000 units of benzathine penicillin maintained a satisfactory serum penicillin level for four hours in children weighing up to 40 lb. (18.1 kg.) and for six hours in children weighing up to 25 lb. (11.3 kg.); 600,000 units were needed to maintain a satisfactory serum penicillin level for four hours in children weighing 40 to 70 lb. (18.1 to 31.8 kg.), and for six hours in children weighing 25 to 39 lb. (11.3 to 17.7 kg.). Their recommended dosage schedule is 300,000 units every six hours for weights under 25 lb.; 300,000 units every four hours or 600,000 units every six hours for weights of 25 to 39 lb.; 900,000 to 1,200,000 units every six or eight hours for weights of 40 to 69 lb.; and 1,200,000 units every six or eight hours for weights of 70 lb. or more. There were no troublesome side-effects, but 26 children had loose stools and 3 had some nausea and vomiting.

Dental Health of Children.—Dental caries are caused by the activities of bacteria, but appreciable decalcification of enamel will occur only under the conditions that are likely to be present in the oral cavity at a pH below 5 (*Brit. Dent. J.* **96**:199, 1954). Among the recommended methods of control of caries are the ingestion of less fermentable carbohydrates, especially candy, between meals. A type of rampant caries affecting mainly the temporary incisors and canine teeth has such well-defined characteristics that the dentist is able to diagnose clinically that the child has been given candy to suck. Sugar consumed at meals has little effect on the production of caries. Many temporary teeth would be saved if mothers realized the disastrous effects that follow the use of candy or cookies to pacify infants when they cry. Tooth brushing and mouth rinsing are valuable measures in controlling caries, but tooth brushing as carried out by most persons is nearly valueless as a means of preventing caries.

The use of penicillin in dentifrices, mouth washes, and chewing gum for the prevention of caries is not advisable because of the risk of focal reactions, the development of sensitization to penicillin, and the production of penicillin-resistant organisms. Other antibiotics are less effective than penicillin for the control of caries. There are grave doubts about the caries-preventing properties of ammonia-urea dentifrices, and undesirable side-effects on the gums have been reported from their use. There is little clinical evidence to suggest that the use of antacids in dentifrices or mouth washes is effective in preventing caries.

A cautious attitude is adopted on the question of the topical application of fluorides in the prevention of caries, but fluoridation of water supplies is given strong backing. When the results of the large-scale investigations undertaken under the auspices of the Fluoride Working Party of the Ministry of Education are published, a more accurate assessment of the value of topical applications of fluorides will be obtained. At best they involve a rigorous and time-consuming technique. No claims have been made that topical application of fluorides will affect any surface other than those to which they have been applied (their applications to the first teeth will not affect the permanent dentition) or inhibit or reduce appreciably the rate of spread of definitely established caries. On the other hand, the recommendation of the United Kingdom Mission to North America is accepted that immediate steps be taken to begin fluoridation of domestic water supplies on a wide investigational basis.

National Blood Transfusion Service.—This service consists of 12 regional transfusion centers, each serving one or more regional hospital board, with an average population of 2 or 3 million persons, and the blood products laboratory and blood group reference laboratory, each administered on behalf of the Ministry of Health by the Medical Research Council. The regional transfusion centers are administered on behalf of the Ministry of Health by the regional hospital boards. Each has a medical director who is responsible for the organization, administration, and professional work of the center and a regional organizer who is responsible for recruiting donors, planning donor sessions, and public relations. The minister is advised on the technical aspects of the service by the regional transfusion directors committee. Each center is responsible for providing the hospitals in its area with blood, transfusion equipment, plasma, and grouping services (prepared at the blood products and blood group reference laboratories) and for carrying out consultative work, teaching, and research. Through the regional transfusion centers a nationwide network of blood banks has been built up. These blood banks are kept in general hospitals and supply the smaller hospitals in the surrounding areas. In this way, blood and plasma are readily available to patients in any part of the country. Rare types of blood can be obtained quickly by reference to the National Panel of Donors compiled from all the centers in England and Wales.

In 1944, 1,005,000 donors were enrolled on the regional panels. This number dropped to 270,000 by the end of December, 1946. Since then there has been a growing appreciation of the fact that blood transfusion has an important role in peace as well as in war, and at the end of 1953 there were over 515,000 donors in England and Wales. This increase has not, however, satisfied the increasing demands on the service, which (in order to avoid calling on individual donors more than twice a year

to provide for the future expansion of the service and to cover normal wastage of donors due to age, ill health, etc.) has a target of another 125,000 donors—or over 600,000 donors in all. Donations have more than doubled since the war. In 1947 they were 296,000 and in 1953 nearly 660,000. Hospitals are now using about 70 times as much blood as before the war—more than one donation for every minute of the day and night.

Training for General Practice.—Since 1952, a general practice course has been a part of the undergraduate curriculum at Charing Cross Hospital Medical School, and a full account of this course has been published (*Brit. Med. J.*, supp., May 8, 1954, p. 217). The student resides with the general practitioner for three weeks and accompanies him on all his calls. He is introduced to the patients as a student physician and examines all patients both in the office and on visits. So far, on no occasion has a patient objected. This slows up the general practitioner's work, but if properly organized his day's work need not be prolonged by more than a fifth. The general practitioner must also be willing, after the day's work, to discuss in more detail the patient seen, to debate nonclinical medical problems, and to study academic medicine with the student. The student learns coordination of general medical care, doctor-patient relationship, medical ethics, application of theoretical medicine to general practice, care of the young and aged, midwifery, common ailments, early symptoms of serious disease, treatment of serious disease in the home, emergencies in general practice, use of hospital and ancillary facilities, preventive, social and industrial medicine, and methods of health education.

During his three week course, one student attended 16 morning and 12 evening office hours and 3 prenatal clinics, seeing a total of 674 patients. Among the diseases encountered were acute otitis media, Raynaud's disease, thrombophlebitis, carcinoma of the esophagus, pityriasis rosea, malignant pleural effusion, hypertensive retinitis, multiple myelomatosis, myeloid leukemia, and Mansonia wood dermatitis. Many hours were spent after the day's work discussing the organization of the practice, National Health Service administration, financial considerations in general practice, paper work, and postgraduate study in general practice. The authors believe that this course has something to offer to the student; it widens his field of vision beyond the boundaries of the hospital, he sees the only branch of medicine left in which he can obtain a general picture, and he also learns the value of continuing care with intermingling of early diagnosis, curative, preventive, social, and occupational medicine, and public health. He should become increasingly aware that the patient is not a case, that the patient is indivisible, that "medicine" is also indivisible, and that specialization can fulfill its proper aims only when coordinated with the general care of the patient.

The Minister and the Drug Bill.—In a recent parliamentary debate, the Minister of Health gave further details of his efforts to reduce the National Health Service drug bill. About 213 million prescriptions per year are now dispensed at an estimated cost of about 55 cents each. The annual cost is $130,200,000, of which the exchequer pays $112,000,000 and patients pay $18,200,000. The cost of basic and proprietary drugs is being investigated. The antibiotics (20% of the total drugs and dressings bill), vitamins (5%), and hormones including insulin (2% each) are being considered. Prices of antibiotics and hormones are falling steadily; the fall in hormone prices is 10%, which means an annual saving of over $168,000 to the exchequer. Sir Hugh Linstead pointed out that the only time the pharmaceutical industry came before the monopoly commission was when the price of insulin was examined, and the industry came triumphantly out of a very detailed inquiry. The ministry is making a detailed investigation of 91 of the 6,000 proprietary preparations that it has categorized according to their therapeutic value. These 91 preparations account for 30% of the total cost of proprietaries to the National Health Service and for 18% of the total drug bill. For each preparation the profit margin and costs of production and sale are being examined. In one important group of these 91 proprietaries it has not been possible to reach agreement with the manufacturers on what the ministry considers a reasonable level of profit. The minister, therefore, proposes to advise the physicians that satisfactory price arrangements have not been made and to ask them not to prescribe these preparations. No indication has yet been given of the preparations involved. The medical press has not commented so far on this latest development, but the *Pharmaceutical Journal* (**172**:391, 1954) stated editorially: "Whether the dramatic saving which the Minister hopes to achieve on a reduction in the cost of these 90 drugs is possible remains to be seen, but it would be a dear way of obtaining it if, as a result, manufacturing firms had either to go out of business or attempt to recoup themselves by raising their prices in the export market."

An Experimental Diagnostic Center.—Three experimental centers are being organized with the help of funds from the Nuffield Provincial Hospitals Trust. One, in Harlow, Essex, takes the form of a small group practice and clinical center and was opened in January, 1952. Another is being planned in Manchester as a teaching health center to be run in conjunction with the medical school of the University of Manchester. The third has just been opened at Corby, Northamptonshire. In 1934, Corby was a village of 1,500 inhabitants; today it is a town of 20,000 inhabitants and an important steel center. As it was obvious that no new hospital would be built at Corby for many years and as the nearest hospitals were at Kettering (8 miles) and Northampton (25 miles), the trust chose Corby for the site of the third experimental center, the aim of which would be "to improve the general practitioners' facilities for giving a good service to their patients, and to see whether—by bringing the specialists to the patients, and into consultation with the general practitioners—the inpatient and outpatient demand on hospitals can be lessened."

The Corby center is a diagnostic center rather than a health center. It consists of examination, consultation, and treatment rooms for general practitioners and visiting consultants from the hospital service, a small laboratory, chest clinic, and x-ray and physiotherapy departments. The family physicians of Corby will retain their existing offices, but patients who need more complete examination will be given appointments at the diagnostic center, where the general practitioners rent some of the consulting rooms. Here the physicians will be able to examine their patients, to consult any of their colleagues, or to arrange consultations with the visiting specialists. Specialist clinics will be arranged by the Oxford Regional Hospital Board for general medicine, surgery, obstetrics and gynecology, pediatrics, chest diseases, physical medicine, psychiatry, otorhinolaryngology, radiology, dermatology, ophthalmology, and orthopedics. The board is also responsible for staffing the laboratory, chest clinic, and x-ray and physiotherapy departments.

Provocative Factors in Poliomyelitis.—In a preliminary report, J. Trueta and R. Hodes (*Lancet* **1**:998, 1954) describe experiments in animals in which traumatic factors, such as the wearing of a plaster cast, exercise, and the injection of irritant solutions into the extremities produced changes in the corresponding segments of the spinal cord comparable to those found in poliomyelitis, i. e., vascular engorgement with and without rupture of the blood vessels. The fact that such widely different types of stimuli can produce macroscopic changes in the circulatory patterns of the spinal cord suggests "that many of the factors which enhance the severity of poliomyelitis, or localize the paralysis, may operate through local vascular changes in the brain and spinal cord." If this concept is valid, "certain practical considerations arise immediately. In addition to the precautions necessary to reduce the chance of infection with poliomyelitis virus . . . the physician should avoid inflicting on the patient any procedure which might seriously affect the blood-supply of the nervous system and endanger the integrity of the blood-brain barrier. Of the potential damaging influences commonly used in medicine, among the most potent are (1) spinal puncture and (2) the injection of various substances. Pending the results of further investigation of the effect of these procedures in human neurotropic disease, medicaments should whenever possible be given otherwise than by injection. Where injection is unavoidable, it would be well to consider the advisability of finding less dangerous sites or less irritant substances to inject than those customarily used."

British Medical Association and World Medical Association.—At a recent meeting of the council of the British Medical Association, Dr. J. A. Pridham, chairman of the International Relations Committee, proposed that the council approve the establishment of a supporting committee or league of friends for the World Medical Association because there is a special need to enhance the status of the World Medical Association in relation to the World Health Organization. He reminded the council that increasingly, through international bodies like the World Health Organization and the International Labor Organization, medicine was being brought into international politics, that it was necessary to know what was going on, and that what happened to physicians in one country would eventually affect those in others. The British Medical Association is the oldest and the second largest medical association in the world, it took the initiative in forming the World Medical Association, and it has something to give to other countries. The motion was agreed to.

Rubella and Congenital Defects.—The medical officer of health for Manchester has taken advantage of the fact that his city is one of the few in which rubella is reportable to investigate the association between maternal rubella and congenital defects (*Lancet* **1**:975, 1954). In 1952, 28 women who were pregnant at the time of rubella infection were reported on. There were five cases of gross congenital abnormality among the children (congenital morbus cordis; bilateral cataract and microphthalmos and thrombocytopenic purpura; congenital morbus cordis with stillbirth; anencephalus with stillbirth; and cataract of the right eye). The week of pregnancy in which the rubella occurred in these cases was the 12th, 1st, 4th, 21st, and 1st respectively. This gives an incidence of 17.9% of congenital abnormalities. In 13 of the 28 women, rubella occurred before the 13th week of pregnancy, and among their 13 infants 4, or 30.8%, had congenital abnormalities. In 1952, 245 cases, or 2%, of congenital abnormality were observed in the 12,367 live babies born in Manchester.

Radioactive Egg.—When Sir Henry Dale, the veteran pharmacologist, recently opened the new Radiochemical Center near London, which is responsible for the production of radioactive isotopes, some details were released of the first radioactive egg to be laid in this country. The radioactive carbon dioxide "waste" from a plutonium plant was used to grow algae. When this algae became radioactive, the protein was mixed up in a £300 bread pill and fed to a hen at the National Institute for Medical Research in London. A fortnight later the hen began laying. The first egg showed no evidence of radioactivity, but the second and the third showed quite a lot; subsequently the radioactivity of the eggs decreased.

ISRAEL

ABO Groups in Blood Platelets.—At the March meeting of the Israel Microbiological Society, J. Gurevitch and D. Nelken of Jerusalem reported that suspensions of blood platelets in normal sodium chloride solution are agglutinated by A, B, and O serums, just as these serums agglutinate red blood cells of the corresponding blood group. It is thus possible to establish four blood groups for the blood platelets, similar to those of the erythrocytes. To 0.3 to 0.5 cc. of inactivated serum in a tube an equal volume of the platelet suspension was added and left at room temperature for two hours. The result of agglutination was read microscopically after two hours by withdrawing several drops of the serum-platelet suspension and spreading it on a slide. Agglutinates of different sizes, from several to tens of thrombocytes, and large clumps of platelets were clearly visible at low magnification. At the first reading after two hours, about 30% of the platelets remained unagglutinated. When left at room temperature for eight hours, large clumps of agglutinated thrombocytes were seen macroscopically. Control examinations of platelets suspended in their own serum or in inactivated serum of the same group always remained negative. No signs of agglutination in the control tests were observed after 24 hours. Similar results were obtained at both 37 C (98.6 F) and at room temperature.

ITALY

Convention of Phthisiologists.—The annual convention of the Italian Society of Phthisiology was held in Turin under the presidency of Professor Costantini, who discussed the lymphatic system in the pathogenesis of pulmonary tuberculosis. The allergic phenomena in patients with tuberculosis are believed to originate in the lymphatic system, and the lymph is believed to have an inhibiting action on the development of the tubercle bacillus. The lymph in the lung of tuberculous persons may move in a direction opposite to the one it follows in healthy persons. The traditional concept that the tubercle bacillus enters the lung through inhalation has been discredited by recent experiments that indicate that the lymphatic oropharyngeal structures of Waldeyer's ring often serve as the first place of implantation of the bacillus that is carried from there to the hilar lymph nodes. This is in marked contrast to the concepts of Küss-Ghon and the so-called Parrot's law concerning the genesis of the bipolar primary complex. This law may be reversed should diffusion to the parenchyma from the lymph nodes be admitted. This diffusion may take place not only through the retrograde route but also through the traditional lymphohematogenous route or, according to the latest bronchoscopic data and in view of the frequent fistulization of the caseous lymph nodes in the large bronchi of the hilus, also through the bronchogenic route. The new concepts have important epidemiological, diagnostic, social, and therapeutic applications.

Professor Fici of Palermo described the concept of active motility of the lung that has markedly modified the previously held concept of the passive function of the lung conceived as a purely elastic organ. He believes that the smooth bronchial or alveolar muscles directly induce this motility. He referred to pulmonary motility as myogenous neurodystonias to distinguish them from other manifestations (vascular, for example) of autonomic pulmonary motility. These help to explain pulmonary phenomena such as the so-called insufflated cavities and functional hemoptyses. The new concepts may also apply to asthma and bronchiectasis. Professor Fici discussed the possible neurovegetative genetic component of some symptoms and characteristics of tuberculosis. In addition to phenomena such as pain and sweating in which the neurovegetative factors are easily understood, he considered the relationships between the allergic state and the autonomic nervous system. These relationships indicate that the orthosympathetic system causes an increase in the phenomena of sensitivity, whereas the parasympathetic system causes an increase in the phenomena of reactivity.

Professor Omodei-Zorini of Rome said that isoniazid has a specific antibacterial action that in vitro is greater than that of streptomycin. In the recommended doses, it is nontoxic for man since the disturbances to the liver, kidney, and other organs, when present, are transistory and mild. Unlike streptomycin, this drug acts on encapsulated and intracellular bacteria and is not restricted to the free bacteria. This property must be related to the high diffusibility of the drug. In vivo there is initially a marked bacillary lysis that discharges into the circulation large quantities of bacterial antigens that stimulate the production of tuberculin. This is accompanied by a pronounced congestion of the involved tissues. In the second phase the bacteriostatic action of isoniazid prevails. This may be associated with marked auscultatory and clinical improvement but not with marked change in the roentgenograms. In the third phase, provided the action of the drug is not augmented by adequate resistance in the host or by timely medical or surgical treatment, the tubercle bacilli become resistant to isoniazid and the condition of the patient becomes stationary or worse. This can be prevented by the combined use of isoniazid and streptomycin. Their combination gives more lasting results because of their cumulative synergistic action.

CORRESPONDENCE

ELECTROSURGICAL OBLITERATION OF THE GALLBLADDER

To the Editor:—In the April 10, 1954, issue of THE JOURNAL, Dr. Edward W. Sickels took issue with some statements in my article on electrosurgical obliteration of the gallbladder, which appeared in THE JOURNAL for Feb. 27. Dr. Sickels does not cite personal experiences, and his statements are unsupported by the literature. He takes exception to my statement relative to mortality following cholecystectomy. "In 1933 the prevailing high mortality following operations on the gallbladder in unselected cases was 9.6%. While it is true that in selected cases without complications the mortality from removal of the gallbladder in experienced hands is around 1 or 2%, a mortality of around 10% is obviously excessive." A reduction of this mortality incidence was the objective of my paper. These statements are upheld by the majority of experienced surgeons. Enderlen and Hotz (*Klin. Wchnschr.* **2**:648, 1923) reported a series of over 12,000 unselected gallbladder operations performed between 1908 and 1923 garnered from the leading clinics of the world. The mortality rate was 9.28%. In a later series of 5,500 operations performed between 1933 and 1945 by competent surgeons, the mortality was 9.27%.

I refer to only a portion of the extensive literature that fully bears out my statements. "The gross mortality for biliary tract surgery, excluding malignant disease, has been 7 per cent" (Carter and others, 1939; Walters and others, 1948). "The operative mortality for mere cholecystectomy for stoneless gallbladder has been 3.6 per cent. Drainage and choledochostomy add significantly to the mortality (Dublin, L., and others: *Proc. A. Life Insur. M. Dir. America,* 1934). "Gross mortality in this group is 11.34 per cent . . ." (Carter and others), ". . . 33 per cent . . ." (Smith, 1938), and ". . . 9 per cent . . ." (Glenn, 1936). "Up to 55 years of age simple cholecystectomy for stone carried a mortality rate of 1.5 to 2 per cent in one series" (Brandberg, 1950). "With increasing age this rate mounted to 21.9 per cent." Dr. Sickels cites only one reference (Mustard and Custer: *Surg., Gynec. & Obst.* **95**:59, 1952) dealing with acute cholecystitis. He writes that "any tissue whether killed by cautery or coagulation will slough and will increase rather than decrease chances of secondary bleeding and infection." This is incorrect. He ignores completely the extensive literature, at least 20 articles on the subject of recorded differences between cauterization and electrocoagulation. Apparently Dr. Sickels is not in possession of the elemental facts on the subject. Electrocoagulation frustrates what carbonization encourages. Electrocoagulation prevents formation and dissemination of thrombi and infectious material. Properly applied, it avoids carbonization and thus eliminates its accompanying evils. The incidence of infarction pneumonias as a result of embolism is minimized, and a variety of complications are prevented. One has only to compare the weeping, bleeding gallbladder bed often resulting in cholecystectomy with the clean, aseptic, dry tissue tampon in the gallbladder bed from electrocoagulation of the posterior wall. The former creates an open infection atrium; the latter prevents it.

Lack of absorption from electrocoagulated surfaces explains the absence of shock, which is prevented by capping the nerve ends in the coagulation process. Schörcher's observations in this connection are illuminating. Electrocoagulated surfaces in the orifices (mouth, vagina, and rectum) and on the surface heal by extrusion and cicatrization; on the other hand intra-abdominal parenchymatous organs (liver, kidney, and spleen) treated by electrocoagulation heal by encapsulation and final resorption. Even if only skin and subcutis are united over an electrocoagulated region, the wound will still heal as long as no infectious material reaches the operative field (von Seemen). The reason for this established fact is that electrocoagulated surfaces are possessed of a positive attraction for serous surfaces (positive chemotaxis). I have observed agglutination three hours after electrocoagulating the surface of the liver. Firm union results in a comparatively short time. Dr. Sickels' confusion of electrocoagulation with cauterization is a serious pitfall.

With reference to ligation of the cystic duct and artery, the surgeon's experience is the deciding factor. When no complications exist, ligation of these structures is accomplished with comparative facility. In a chronically inflamed or gangrenous gallbladder, in which Hartmann's pouch obscures the structures in the cholecystoduodenal ligament by adhesions, edema, and infiltrations, one would not think of exposing and ligating the cystic artery without hazard, but would depend on electrocoagulation.

Dr. Sickels does not furnish any proof justifying his condemnation of electrosurgery. His views are contradicted by authorities such as Hamilton Bailey and R. J. McNeill-Love (*Brit. M. J.* **2**:682 [Sept. 30] 1939) and others. These authors, as early as 1939, reported 129 unselected cases in which they performed the electrosurgical operation with no mortality. They say: "The above series of cases is entirely unselected. Furthermore, we have performed Thorek's cholecystectomy in several instances where previously, owing to the enfeebled state of the patient, we would have submitted cholecystostomy for the standard cholecystectomy. This series includes a child of 8, one patient of 85, another of 81, and three over 70 years of age. There were also seven patients with an empyema of the gallbladder, all of whom made an uneventful convalescence after the wound had been closed completely." "Experience confirms our opinion that electrosurgical obliteration of the gallbladder is a distinct advance on the standard operation of cholecystectomy." These same authors state that the more important advantages are (1) diminished mortality; (2) reduced postoperative discomfort ("We have been deeply impressed by the smoothness of the convalescence and absence of worrying symptoms as compared with those that commonly occur during the first few days after the standard operation."); and (3) rapid convalescence ("It is exceptional for the wound to heal other than by first intention."). The same authors reported excellent results in subsequent years with a larger series of cases. Close to 5,000 unselected cases were reported in the last 20 years in which the mortality was between one-third and one-half of 1%.

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RAUWOLFIA SERPENTINA DERIVATIVES

To the Editor:—We wish to report briefly the following alarming experience with the use of reserpine (Serpasil), one of the Rauwolfia serpentina derivatives. A 43-year-old white man had a stable uncomplicated hypertension with a blood pressure level of 160-170/105-115 mm. Hg. He had never had any pain suggestive of angina pectoris. After careful evaluation in the office revealed no other significant abnormalities, he was given reserpine one-half of a 0.25 mg. tablet (0.125 mg.) three times a day after meals. When he was seen 10 days later, he gave a classic description of angina pectoris involving primarily the right arm and forearm and substernal area with crushing pain coming on about 45 minutes after the taking of each half of a tablet. These symptoms were more pronounced the longer after his meals that he took the tablet. He had found that the discomfort lasted only a short while if he lay down or relaxed and that the discomfort was aggravated by exercise or emotion. He was told to take one-half of a tablet twice daily and to report to our office immediately with the next episode in order that an electrocardiogram could be made. He tried to do this the next morning but collapsed on the street just a block from his office. When seen within a very few minutes, he was in peripheral vascular shock and appeared critically ill, pale, clammy, cold, and mentally confused. He was given nitroglycerin, 1/200 grain (0.3 mg.), under the tongue because of the crushing chest pain and was soon relieved. He was then

brought to our office and an electrocardiogram was made that revealed no definite abnormalities, although there was a little coving of the ST segments in leads V_1 and aVr. After he had rested in the office for a while, he was sent home. His blood pressure reading was 110/80. He did not feel quite well at that time and was still a little weak and uncomfortable. The next day an electrocardiogram still revealed a normal pattern and his blood pressure was 132/90.

This patient's severe reaction seems to be due to reserpine, because it was the only medicament he was taking. It produced in him a definite reaction almost every time and eventually a serious hypotensive shock that simulated myocardial infarction. The patient has had no further trouble since reserpine tablets were exchanged for placeboes that look just the same.

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PROTECTION AGAINST LIGHTNING

To the Editor:—In the April 17, 1954, issue of THE JOURNAL (page 1353) the "Code for Protection Against Lightning," compiled by the National Bureau of Standards, suggested in part that shelter from lightning should be sought in a cave. Despite the recognized reliability of the Bureau of Standards, it appears that, in this case, it has been misled by the scarcity of physical studies in North American caves—a deplorable situation that the National Speleological Society is attempting to correct. Studies by European speleologists have revealed that conductivity and degree of ionization of cave air generally exceed that of outside air (British Caving, Cullingford, C.H.D., editor, London, Routledge & Hegan Paul, Ltd., 1953, p. 151), and it is their belief that this creates a potential lightning hazard. It is an empirical observation that trees near the mouths of caves in certain French forests are more frequently struck by lightning than those elsewhere in the woods (Casteret, N., quoted by Myers, J. O., in British Caving). Furthermore, a noted French speleologist was knocked from the steel cable ladder on which he was descending in the cave of the Hennemorte several years ago when lightning struck a tree at the edge of the cave entrance. Fortunately, he was tied to a safety rope at the time and suffered no severe injury (Trombe, F.: Le Mystère de la Hennemorte, Paris, Susse, 1948, pp. 60-61).

In North America, newspaper reports in recent years have told of the death of a girl scout and injury of several others when lightning struck the entrance of Wind Cave, Wyoming. In addition, one mountaineer was reported killed and at least one was injured while climbing in the Bugaboo range of British Columbia when the rock shelter in which they were resting was similarly struck. As a result of these observations, it appears that caves, and even mere rock shelters, are actually very unsafe refuges during thunderstorms.

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VERTEBRAL FRACTURES AND ELECTROCONVULSIVE THERAPY

To the Editor:—We wish to answer some of the points raised by Dr. Joseph Epstein in his letter (*J. A. M. A.* **155:62** [May 1] 1954) criticizing our paper "Vertebral Fractures as a Complication of Electroconvulsive Therapy" (*J. A. M. A.* **154:981** [March 20] 1954).

Dr. Epstein believes that we created a false impression as to the general incidence of these fractures because we failed to consider the alleged decrease in incidence of fractures when using the Reiter technique. However, it would seem obvious that our findings, which are the result of the first statistically validated study of this type, are representative of only one particular technique of administering electroconvulsive therapy, as is described in our paper. The importance of these results is indicated by Dr. Epstein's statement that this same technique is currently in use in "many, if not the majority of hospitals." It seems, therefore, that our results represent a statistically valid indication of what the incidence of these fractures is among the overwhelming majority of patients who receive electroconvulsive therapy.

We cannot evaluate the possibility that the incidence of these fractures is diminished by use of the Reiter technique. Dr. Epstein's claim, that he found no fractures in 100 consecutive patients treated by the Reiter method, cannot be accepted as scientifically valid, unless it can be shown that all 100 patients were subjected to the control of x-ray examination of the spine before and after electroconvulsive therapy. In our study it became apparent that many of the fractures could not be diagnosed without comparison to the control film and that pain, used as a criterion by Dr. Epstein, was not by itself an adequate guide to the presence or absence of a fracture. It is to be hoped that in the future a scientifically designed and controlled study in which the Reiter technique is used will be carried out, so that the incidence of fractures with this method may be accurately ascertained.

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SILICONE ANTIFOAM TABLET IN GASTROSCOPY

To the Editor:—The value of gastroscopic examination of the stomach has been adequately emphasized. At times, however, the procedure is useless because the mucosa is obscured by bubbles generated by the air insufflation. In an attempt to counteract this difficulty, the possibility of employing compounds that decrease surface tension was considered by Dr. John Carbone, fellow in gastroenterology. It was decided to employ silicones. A tablet was produced that consisted of 10 mg. of Anti-foam A, (Dow Corning Corporation), 50 mg. of lactose, and the necessary isopropyl alcohol. This readily soluble tablet is swallowed with approximately 10 cc. of water 15 minutes before gastroscopy. It appeared that the production of vexacious bubbling was thereby decreased. The silicone tablet (available as Gastric-Nonfoam Tablets, Barnes-Hind Laboratories, Inc., 430 Post St., San Francisco) has no value in combating the viscid and copious contents of gastric retention. Gastric lavage is required in such instances.

In a control series of 136 consecutive gastroscopic examinations, foaming of the gastric juice occurred to such an extent that a completely adequate examination was impossible in 7.3%. In 137 examinations in which the silicone tablet was used, similar foaming occurred in only 4.3%. This latter figure might be reduced further by using more than one of the silicone tablets and by having the patient assume various positions to allow the ingested material contact with all areas of the gastric mucosa. In no instance was there observed any local change in the gastric mucosa resulting from use of the silicone tablet.

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COUNCILS ON NATIONAL EMERGENCY MEDICAL SERVICE AND ON INDUSTRIAL HEALTH

The following papers were read at a civil defense meeting sponsored jointly by the Council on National Emergency Medical Service and the Council on Industrial Health at Louisville, Ky., Feb. 25, 1954.

STATE EMERGENCY MEDICAL SERVICE IN MISSISSIPPI

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There has been a general lack of "know-how" in many parts of the country in getting interest and coordination in disaster programs. Many parts of such programs have been developed, but often the busy doctors comprise the one group that has failed to get interested in any "dry runs." Therefore in our state of Mississippi, which is largely a rural state, we set our sights toward the development of a program based on what some of us had learned the hard way, that is, the only way to get a good organization and a good operation going was to initiate it in the "grass roots." For this reason, when this emergency medical service program was handed to me in 1951, it became necessary to plan some long-range strategy in order to develop it and to sustain interest.

DEVELOPMENT OF THE STATE PROGRAM

The president of our medical association appointed me chairman of a committee and upon my advice placed on the committee a member from each of the other eight councilors' districts in the state, making a total of nine members. We represented the 82 counties in the state, with a minimum of 6 and a maximum of 11 counties in the councilor districts. We felt that our object was twofold: first, organization of the medical profession so that it could be mobilized in case of disaster and, second, coordination with all other branches of civil defense or mobilization in a state plan for relief. This was our goal.

Mr. Rowland B. Kennedy, the executive secretary of our state association, and I attended the Chicago meeting of the Medical Civil Defense Conference, which was sponsored by the A. M. A. in November, 1951. It was quite evident from our experience as well as from that of the group assembled there that the threat of war, atomic bombing, etc., would not unite the medical profession in a program. Their interest was not aroused, it was hard to get them to plan, and very little energetic action was displayed anywhere. We are not warmongers; we could not and cannot see the threat even yet, but we of the medical profession have the reputation of always standing ready to serve in case of a disaster. Therefore 1951 was picked as the year to organize and to coordinate with all other medical and lay groups in a disaster program. We did not meet with much ready response until we moved away from the atomic bomb and war field into the disaster field of our own state and communities. These disasters have been caused by tidal waves, cyclones or tornadoes, and boat, air, or rail accidents. We began to see enlightenment in the faces of our people with this plan. While we realized that definitive medical treatment can only be administered completely by the practicing medical profession, we felt that the public health physicians could and should coordinate all allied medical groups into one working machine. I must say that this is yet not complete but is in the process of development.

We soon found that the family doctor was the man who could best inform, educate, and arouse the public to action in organization and preparation for disaster. We were able to obtain his interest and support by explaining to him that definitive standardized emergency medical treatment is the tried and best-known method of saving lives in a disaster. The 82 counties in the state each had a county chairman, and each county had a co-chairman in each of the five districts of the board of supervisors, and each of the nine councilor districts had a chairman, so you can see that we had an echelon from the grass roots up in our organization. Therefore a plan was aimed at the family doctor in the local communities. Every county or district medical society or both was visited during 1952, and a symposium was presented on "Definitive Standardized Emergency Medical Treatment." A traveling team of five physicians presented the following program 12 times:

1. Introduction and Explanation—Lawrence Long, M.D., Chairman EMS Committee
2. Emergency Resuscitation and Anesthesia As Well As Treatment of Shock and Hemorrhage in Case of Disaster—Curtis Caine, M.D. (Anesthesiologist)
3. Emergency Treatment of Burns (Thermal and Radiation)—Thomas J. Safely, M.D. (Surgeon)
4. How Best to Handle Lacerated, Crushing, and Penetrating Wounds in an Emergency—George E. Twente, M.D. (Surgeon)
5. Treatment and Transportation of Fractures in an Emergency—T. H. Blake, M.D. (Orthopedic Surgeon)

At the conclusion of each presentation a general discussion was entered into by the hundreds of physicians who attended the meetings. A refresher course was offered to our medical profession, which stimulated the family doctor's interest, and he in turn stimulated the family interest in disaster work. We also emphasized the need for local emergency call service in every town and community, so that physicians could be secured by the public when needed. This service has been placed in effect in many communities and towns and is an aid to the public and to medical public relations as well.

ORGANIZATION OF DISASTER TEAMS

Obviously, the next step was to secure the organization throughout the state of teams to work at home or abroad in case of disaster. In every town and city in the state of Mississippi the county chairman and the five co-chairmen, with the cooperation and coordination of the local medical society, have now several hundred teams of these categories: (1) general surgical, (2) thoracic surgical, (3) neurosurgical, (4) maxillofacial, (5) fracture, (6) blood bank, (7) roentgenological, and (8) medical. Most teams consist of a surgeon, assistant surgeon, anesthetist, and surgical nurse, except for the blood bank team, which consists of a pathologist, laboratory technician, and two nurses, and the roentgenological team, which consists of a chief roentgenologist, an assistant, an x-ray technician, and a nurse; the medical team consists of internists, cardiologists, pediatricians, dermatologists, etc., three in number, and two nurses, so that all can travel in one automobile. The captain of each team has the names and telephone numbers of all members, and location and alternate location have been designated if the original place is not available, in case the communications are out locally when a disaster occurs. These teams are ready to go, or stay, where needed.

All of the plan and program has required much work and correspondence. The committee as a whole has had to be active to accomplish our task, and we have been fortunate to have the aid of a good executive secretary. Now if a catastrophe occurs in Mississippi we will be ready and organized. We do not look for an atomic bomb. We do not believe we will have enemies within our state boundaries, but we do know that we might have a tornado that could play havoc in a city and community as evidenced by what happened at Vicksburg, Miss., on Dec. 5, 1953. While the medical facilities were adequate to care for that disaster, often they are not. There are about 50 physicians and 400 hospital beds in that city's four hospitals, and there were 38 deaths and about 350 casualties in the tornado's path of destruction. First-aid stations were set up in two of

Chairman, Committee on Emergency Medical Service, Mississippi State Medical Association.

the schools, and all of the hospitals were ready, by placing cots in the corridors and taking similar measures, to care for the injured. In Jackson, 40 miles away, teams were alerted and ready to come to assist. We feel that it was important that the symposium on "Definitive Standardized Emergency Medical Treatment" had been presented to the doctors there, since it had made them think and plan before the emergency happened. A new thought was set off when these doctors unanimously agreed to make no charge for any service rendered during the first 24 hours of the catastrophe in spite of the monies appropriated and made available for this disaster.

I wish also to pay tribute here to industry, which played such an important role in working in this torn and stricken area by removing the injured and dying from the scramble of timbers and rubbish resulting from such a tornado, so that the medical personnel was able to treat them and restore them to health.

SUMMARY

The emergency medical service program of a state is an extremely important one and must be sold to all physicians in the state. This can best be done by an educational program that stresses preparation for disaster from causes other than war. The state organization must be built up solidly from the "grass roots" and must maintain liaison with all other groups and agencies at all levels. Industry, too, can be relied upon for help in disaster relief.

THE VICKSBURG TORNADO DISASTER

George H. Martin, M.D., Vicksburg, Miss.

It was 5:35, Saturday afternoon, Dec. 5. The weather was warm and humid, and dusk had begun to fall. The downtown stores were closing, and the buses were filling with homebound clerks and secretaries. The theatres still held scores of youngsters indulging in the Saturday cowboy matinee. At the Happyland Nursery, the little tots were being fed and dressed for their working parents to pick them up on their way home. The 32,000 inhabitants of Vicksburg went calmly about their usual tasks.

Suddenly, from out of the west, roaring like 10 highballing freight trains, came a funnel-shaped swirling cloud—in the center, a tremendous vacuum capable of lifting the roofs from buildings, and, around the periphery, a screaming counterclockwise wind ranging an estimated 200 to 500 miles per hour. Crossing the Mississippi River and the Yazoo Canal, the storm hit the river front. The Union Cotton Compress warehouse turned to rubble, and 3,000 bales of cotton went up in smoke in the fire that followed. The Illinois Central Railroad roundhouse collapsed. Locomotives were tumbled like toys. Turning northeastward, the storm reduced the warehouse district to a shambles and then climbed up the hill to the main business district. Here were hardware stores, clothing stores, cafes, and barbershops. Roofs collapsed onto the second floors, second floors crashed into the first, and the whole mass of rubble plunged into the basements. On up the hill to the children's matinee raged the storm. The back wall of the Strand Theater exploded onto the stage. The entire roof of the Saenger Theater, lifted from its wall by the vacuum, crashed back on the heads of unsuspecting youngsters. But this was not enough. The frame building of the day nursery was reduced to matchwood—toll: 2 tots dead, many injured. And so the wind swirled out through the residential section, leveling houses, uprooting trees, and smashing automobiles, finally to disappear into the wooded hills of the National Military Park. There followed a deafening silence broken only by the crackling of fires springing from broken gas lines.

The results—in 5 awful minutes, a swath of destruction two blocks wide and 6 miles long—over $25,000,000 in property damage, 38 dead, and 385 injured. With the onset of the storm, the entire city was plunged into darkness due to extensive damage to power lines in the storm area. Water pressure failed because of disruption of power to electric pumps and loss of pressure through broken water mains. Because of the danger of fires in the disaster area, the main gas valves were closed, ending all natural gas supplies to the city. Telephone communications in the storm area were totally destroyed, although many parts of the city and the main telephone exchange had intact service. The streets in the disaster area were nearly impassable as a result of debris, fallen wires, and rubble falling from damaged buildings. It was impossible for ambulances and fire engines to travel these streets until they were cleared.

Vicksburg has four hospitals with a total of about 400 beds and 55 physicians. Fortunately, there was no damage to any of the hospitals. One of the favorable factors in handling the injured persons was the proximity of the hospitals to the disaster area, many of them as close as one or two blocks to the business district. The immediate problem was to notify doctors, nurses, and other personnel to report to the various hospitals, as dwellers in the outlying districts had no idea that such a catastrophe had occurred. The doctors who could be reached by telephone were notified by a special operator assigned to the hospital by the telephone exchange. Other doctors and nurses residing where telephone lines had been destroyed were notified by couriers in automobiles. It was amazing how quickly personnel reported for duty. Within an hour, the entire hospital staff, including all nurses off duty, operating room supervisors, maintenance engineers, orderlies, and technicians, had assembled at the hospital. I reached Mercy Hospital about 20 minutes after the storm struck and shortly after the first casualties began to arrive. All parts of the hospital other than the operating suite, which is supplied by an emergency generator unit, were in total darkness except for flashlights and candles. There was no elevator service because of power failure. Patients had to be carried to upper floors on stretchers. The casualties rapidly overflowed the emergency rooms at the hospital and were placed in offices, in the lobby, on the floors, and in the halls. The immediate problem was to classify the patients as to type of injury, to give emergency first aid to those with excessive bleeding, and to administer plasma or serum albumin to those in shock. Here, the disaster teams previously organized by Dr. Lawrence Long of the state Committee on Emergency Medical Service proved invaluable. Organization of the medical staff was rapid and sure. The hospital dining room was set up as a shock room. Two small dining tables pushed together formed an excellent emergency table for administering fluids to counteract the effects of shock or for treating minor injuries. Lesser lacerations were sutured immediately, and patients were discharged to return the following morning for tetanus antitoxin injections and observation. The patients in shock were given plasma or serum albumin. Fractures were splinted, and the patients were transferred to the x-ray department for roentgen examination. Major injuries requiring surgical treatment were treated for shock and removed to the operating suites for definitive surgery.

One hour and twenty minutes after the storm, electrical power was miraculously restored to the hospital. Now the task was easier. Frantic parents could find missing children. The injured, even though covered by dirt and blood, could be recognized. The flow of injured moved steadily through definite channels. There was no major panic. Doctors and nurses worked quietly and swiftly. Volunteer workers were everywhere, transporting the injured, setting up additional beds and carrying supplies. The solariums were converted into wards. Extra mattresses were placed on the floors in the halls. Cots in private rooms provided beds for the lesser injured. Finally, the steady stream of arriving ambulances dwindled to a trickle.

In the operating rooms, teams of surgeons, anesthetists, and scrub nurses worked rapidly, sometimes two or three teams in one operating room using stretchers as operating tables. Lacerations were debrided, sutured, and bandaged, and the patients were sent out for distribution to the various floors. Fractures were reduced and casts applied. In one room, debridement of a compound skull fracture was proceeding, and in another, an emergency tracheotomy was being performed to prevent a patient with a severe maxillofacial injury from drowning in her own blood. Sometimes two surgeons sutured lacerations at different sites on the same patient. Finally came the word "All patients cleared from the shock room." Only occasionally were there casualties arriving now, these being dug from the rubble still alive; some, by a miracle, were only slightly injured—the time: 11 p. m., five and one-half hours after the storm struck.

Meanwhile, in the disaster area, rescue operations were in full swing. Within minutes after the storm, the police station at the city hall was designated as rescue headquarters. All of the city's military agencies were mobilized for service. Military reserve units were asked to report in uniform to take over traffic control and similar functions. The state highway patrol had two cars in the city and soon brought in two others to set up a two-way radio communication network for disaster work. The Mississippi State National Guard, officially ordered into action, had troops and equipment in service within two hours after the storm. Neighboring cities, some as far away as 100 miles, rushed firemen, policemen, ambulances, and rescue units into the area. Volunteer workers by the hundreds reported for rescue work. The most urgent need was to dig out the living victims, many of whom were buried under mounds of rubble. This had to be done by hand, a brick and timber at a time. Heavy machinery could not be used for fear of causing further injury to the victims. Men and boys worked like Trojans, digging through the debris and passing it out in bucket brigades, unmindful of the danger from crumbling walls. Local hardware stores stayed open all night to furnish hand tools and equipment to anyone who requested it.

One of the major problems was that of lighting. Hundreds of flashlights and batteries were passed out to workers by local merchants. Soon these were supplemented by mobile generator units rushed to the area by industrial concerns, local contractors, and government agencies. Rescue units from neighboring cities appeared shortly with completely equipped trucks, trained crews, and their own generating plants. By 3 a. m., nine and one-half hours after the tornado, every living victim had been rescued from the ruins. All demolished buildings were carefully checked, and any persons who were unaccounted for were considered to be dead. Many bodies buried under mounds of wreckage could be reached only by using heavy machinery.

A dramatic story could be told concerning work of the utilities services, but it would only be typical of the way that public service companies operate in emergencies all over the country. Electric service was restored to three of the hospitals and to the water works in shortly over an hour after the disaster struck. Needless to say, emergency repair crews worked around the clock to restore operations as quickly as possible. Two-way radio communications between repair trucks and the main plant of the Mississippi Power and Light Company played an important part in coordinating repair work. The path of the storm caused so much damage to main gas lines that it was necessary to shut off all natural gas services to the city. Repairing these lines would have been an endless job for the employees of the Vicksburg Gas Administration working alone. However, the United Gas Lines Company, which services industrial users south of the city but does not sell to the city system, rushed over emergency crews and technical assistance. Gas service was returned to the city in three days.

As stated before, communications within the disaster area were carried out using two-way radio communication of the police department, state highway department, military units, and the Vicksburg District Corps of Engineers. Outside the storm area, the Southern Bell Telephone Company lines were swamped with calls even though only emergency calls were accepted. Long-distance lines were jammed with calls from persons inquiring about the welfare of friends and relatives. Operators worked through the night and the next day to clear as many of these as possible. In the 24 hours after the storm more calls were completed than ever before recorded in the history of the local exchange.

Worthy of special mention is the important contributions to communications made by the amateur radio operators in Vicksburg. A network of seven ham stations in the city were functioning within a few minutes after the disaster occurred. Contact with the Central Gulf Coast Hurricane Net was made, and 42 amateur stations throughout the southern states were standing by to render assistance in communications. These stations in turn established contact with other stations throughout the country and with the Military Amateur Radio System. By supplementing the limited long-distance facilities, these amateur operators contributed materially, not only the handling of messages of emergency nature but also accepting welfare messages inquiring as to the safety of citizens of Vicksburg. Each of the local stations handled several hundred messages of this type.

One of the most valuable services was that performed by the local radio station WQBC. As soon as electric power was returned to the transmitter, the station assumed a major role in keeping the local population informed of developments in rescue operations. The radio announcers talked on through the night and all the next day, though hoarse to a whisper, relaying requests for volunteer rescue workers, trucks and equipment, blood donors, coffee and sandwiches for rescue workers, and for blankets and electric heaters to be used in hospitals without gas heat. They read casualty and death lists, located missing persons, and allayed fear and anxiety in general. The *Vicksburg Post Herald* newspaper building became headquarters for the many visiting reporters and photographers. Teletype lines were intact, enabling news services to get information to the rest of the country. Even though there was no gas supply available to heat the metal melting pots of the paper, the *Sunday Post Herald* came out as usual, having used charcoal as fuel.

The morning after the tornado, the weather was cold but clear. The more pressing problems were (1) to restore vehicular access to the strickened area as soon as possible, (2) to complete removal of bodies of victims from the debris, and (3) to eliminate immediate hazards to workers because of leaning walls and hanging wreckage. Streets were blocked with debris throughout the stricken area and could be traversed only on foot. The danger of fire spreading throughout the wreckage was imminent, and, with streets blocked, fire-fighting equipment could not have operated. Hanging and leaning wreckage of all kinds threatened momentarily to fall upon rescue workers. It was known that some persons remained in the wreckage, although the possibility of these persons being alive was extremely remote.

Vicksburg is the headquarters of the Mississippi River Commission, known throughout the nation for its continuing and successful effort toward control of the mighty Mississippi River. Under the commission work the Vicksburg District Corps of Engineers and the Waterways Experiment Station. At a meeting of the city officials with Major General Wilson of the Mississippi State National Guard, it seemed only logical that the Corps of Engineers assume the function of directing all operations in the stricken area. Gen. John Harding, president of the Mississippi River Commission, accepted this responsibility and placed Col. T. B. Simpson, district engineer, in charge of operation and requested Col. C. H. Dunn, director of the Waterways Experiment Station, to cooperate. Under their supervision, the clean-up work was so systematically performed and so swiftly executed as to be almost unbelieveable. Without a doubt, the Corps of Engineers did more than any other group to bring order out of chaotic Vicksburg.

Although Vicksburg is not primarily an industrial city, the industries located in Vicksburg did their share and more in the disaster. With the onset of the storm, all of the industrial plants shut down and went on stand-by basis, releasing as many employees as possible to help in the rescue work. On Dec. 6, there were 169 trucks and vehicles working in the disaster area, many of these provided by local contractors and industrial concerns. A total of 42 pieces of heavy equipment (bulldozers, draglines, front-end loaders, pole trucks, etc.) were on the job. It was estimated that 94 pieces of miscellaneous equipment, including power saws, compressors, and power plants were in operation. The number of persons actually engaged in work under the supervision of the corps of engineers at the peak of activity on the 6th of December is estimated at 2,000. The streets were quickly cleared and hazardous buildings rapidly put in safe condition for further rehabilitation.

The R. G. LeTourneau Company of Mississippi, manufacturers of heavy-duty earth-moving and land-clearing equipment, quickly rushed several units of its equipment together with skilled operators to the scene of the tornado. Tournadozers and Tournacranes were supplied with crews. The "dozers" worked for 7 days and nights, and the Tournacranes worked constantly during the daylight hours. These were used mainly to clear areas for rescue workers, to lift heavy objects, and to open paths for ambulances and fire-fighting equipment. Although the city offered to pay for the use of this equipment, Mr. LeTourneau

declined payment. It is estimated that, had he rendered a bill, it would have been about $3,500. The Kaiser Construction Company, which was building a factory for Westinghouse Electric Corporation, rushed to town emergency power generators and took over the responsibility of providing power for the Chamber of Commerce offices used for headquarters for the Mississippi National Guard. Westinghouse Electric Corporation, in the process of building a new factory and without equipment of any particular service, opened its cafeteria to supply food to rescue workers and offered the services of its 125 employees in clean-up work. The Spencer Chemical Company, in the midst of testing certain equipment in their new plant at the time of the tornado, first of all had to consider safety measures at their plant, since some of this equipment involved high-pressure and dangerous gases. As quickly as possible, Spencer went on a stand-by basis and assigned all unnecessary employees to general clean-up and rescue work in the tornado area.

Too numerous to mention were the businesses that made available for days at this time their dump trucks, hoists, bulldozers, draglines, and anything else that might be used effectively in rescue and salvage work. Two of the largest industrial firms were so severely damaged in their own operations that they did not figure as much in the community rescue and salvage work as might have been possible. These were the Anderson-Tully Lumber Company, which had one of its lumber mills badly damaged and another threatened by fire, and the Illinois Central Railroad, which lost part of its roundhouse, machine shop, and several service buildings. Most of the switching yard was littered with debris, making it difficult to handle the moving of trains. Although these concerns were busily engaged in repairing their own damage, they also furnished trained crews, especially electricians, to help dispose of live power lines that were strewn over the streets. Numerous employees of the Illinois Central Railroad were excused from their regular assignments and encouraged to work in the rehabilitation work. After the main tracks of the Illinois Central had been cleared, such equipment as bulldozers, front-end loaders, graders, trucks, etc was offered to the city to use as was seen fit.

At the hospitals in the meantime, help was arriving from many sources. Plasma had been brought in from Jackson, Miss., and a plane load of plasma was flown to Vicksburg from Keesler Field at Biloxi, Miss. Hospitals in neighboring cities sent truck loads of blankets, sheets, and other linens and released student and graduate nurses from their own hospitals to work in the hospitals in the disaster areas. The hospitals were deluged with calls from doctors throughout the state offering their services in any way in which they could be used. The blood banks were rapidly filled to capacity by lines of people who came to donate blood. The Red Cross brought both plasma and serum albumin to be used as necessary. The hospitals were heated with individual electric heaters, since the main furnaces were out because of gas failure. These heaters were supplied by many local and regional business concerns.

Three days after the tornado, rescue work and rehabilitation were well under way; individual concerns were now withdrawn from rescue work and the further demolition and repair turned over to private contractors. At a meeting of the local medical society with representatives of the National Red Cross, a motion was made and unanimously adopted that physicians would make no charges for emergency treatment administered to accident victims during the first 24 hours of the emergency. This service was gladly given in spite of the fact that there was money available from the Red Cross and other relief agencies to pay for medical care for these victims.

Great as was our tragedy and loss of property, there were many things for which we could be thankful. The death toll was relatively low, with a loss of life of 38 persons. Total injuries treated amounted to 385; 81 of these were considered major injuries and 304 minor. One hundred and sixteen persons were hospitalized. At the present time, there are 42 persons still undergoing medical care, mostly for fractures or reconstructive work that requires time for final recovery. There were no individual heroes in the Vicksburg tornado. Everyone worked to his utmost with one thought in mind, to save as many lives as possible.

MEDICAL FILM REVIEWS

Total Gastrectomy for Carcinoma of the Stomach: 16 mm., color, sound, showing time 38 minutes. Prepared by Edward M. Farris, M.D., University of Oklahoma School of Medicine. Produced in 1953 by and procurable on loan from Tumor Clinic, University Hospitals, 801 N.E. 13th St., Oklahoma City.

In this film the possible zones of lymphatic involvement and methods of submucosal spread in gastric carcinoma are illustrated by animation. The film is a composite, although most of the scenes are from a single operation done on a patient with carcinoma of the gastric cardia with extension to the pancreas. The abdominothoracic approach is illustrated both with and without rib section, and the Roux en Y type of esophagojejunostomy is shown. Attempt is made throughout the film to show surgical anatomy. Technical considerations such as methods of exploration, determination of resectability, identification of the common duct, the method of duodenal stump closure, and details of radical en bloc removal of stomach, spleen, and greater and lesser omentum are illustrated. The surgical technique herein presented is admirable. Much time, possibly too much time, is devoted to a detailed description of the lymphatics. This could have been abbreviated and additional time spent on some animation that would describe the principle of a Roux en Y anastomosis. Of questionable value is the recommendation of frozen section to determine the extent of the lesion. Also of questionable value is crushing of the phrenic nerve. Immobility of the diaphragm can be accomplished by hyperventilation anesthesia, and phrenic crush predisposes to postoperative atelectasis, which is a major cause of death in many of these resections. The term splenorenal attachment is vague. This is not a picayunish criticism, since the operator is shown cutting the "attachment" as an avascular structure. This is anatomically incorrect; the splenorenal ligament contains the splenic vessels. It would have been preferable had the narrator used the more accurate term left leaf of the splenorenal attachment. The term satisfactory loop of jejunum makes one wonder what satisfactory means; the description is too vague and is of little teaching value. The esophagojejunostomy was nicely executed; however, more close-up shots would have demonstrated the technique more clearly. Drawings of the completed procedure would have enhanced the teaching value of the film, and postoperative views of the patient alive and eating are always convincing. These criticisms do not detract from the film. This film can be recommended for those who are versed in gastric surgery and interested in total gastrectomy. It illustrates the satisfactory results that come from careful planning among surgical team, cinematographer, and artist.

The Little Red Door: 16 mm., color, sound, showing time 20 minutes. Produced in 1953 by the Marion County Cancer Society with the cooperation of the Cancer Committee, Indianapolis Medical Society. Procurable on purchase ($125.00) from Marion County Cancer Society, 1101 W. 10th St., Indianapolis 7.

This film is a report to show the public the value and activities of a voluntary health group, such as a county cancer unit, in promoting research, service, and education in its chosen field. It reveals that a public alerted but not frightened into inaction by the seven danger signals of cancer can be an effective ally of the physician in the detection and control of this disease. The film describes services that the local cancer society makes available to the cancer patient, such as surgical dressings made by volunteers, hospital room accessories, comfort articles, and transportation. This film would be useful in promoting the program of the cancer society if one discounts the many references to Indianapolis and Marion County. As a production, this picture is very well done and well organized. The photography is excellent. It might be used before adults as promotional and campaign material preliminary to fund drives and as a means of stimulating the recruitment of volunteer workers in the cancer society program, for adults and possibly science classes in the upper grades of high school, and other students in biology and health, to illustrate the danger signs and symptoms and the various means for diagnosis and treatment.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

The Electrocardiogram in Potassium Depletion: Its Relation to the Total Potassium Deficit and the Serum Concentration. W. B. Schwartz, H. D. Levine and A. S. Relman. Am. J. Med. **16**:395-403 (March) 1954.

The correlation between the electrocardiogram, the potassium deficit, and the serum potassium concentration was analyzed in 14 electrolyte and nitrogen balance studies carried out on nine normal persons in whom potassium depletion was produced by administration of desoxycorticosterone acetate, hydrocortisone (compound F), ammonium chloride, or ammonium sulfate and on two patients with severe chronic potassium depletion resulting from diarrhea induced by overuse of laxatives. Electrocardiograms were taken with the use of 9 or 12 leads, and recording was done with a direct-writing amplifier-type electrocardiograph. For purposes of classification and analysis, no serum change smaller than 0.5 mEq. per liter and no balance change smaller than 40 mEq. was considered significant. In only half of the observations on persons depleted of 40 to 550 mEq. of potassium did the electrocardiogram show evidence of potassium depletion. The electrocardiogram was often normal with low serum potassium concentrations and conversely was sometimes abnormal with normal serum concentrations. When changes occurred in the electrocardiogram, they were not quantitatively related to either the potassium deficit or the reduction in serum concentration. There was sometimes a lag of one or more days in the electrocardiographic response to acute loss or retention of potassium. Only in the persons who had been given hydrocortisone were there significant losses of nitrogen, and in these the uncorrected potassium balance was better correlated with the electrocardiogram than was the balance corrected for nitrogen. None of the persons with acidosis presented electrocardiographic evidences of potassium depletion. It is concluded that in potassium depletion of moderate severity the electrocardiogram cannot be relied on as a guide to diagnosis or therapy. The electrocardiogram is consistently related neither to the total potassium deficit nor to the serum potassium concentration. No conclusions can be drawn concerning the relationship of the electrocardiogram to intramyocardial potassium concentration.

Overcoming the Pitfalls in the Differential Diagnosis of Jaundice. F. B. Moosnick. J. Kentucky M. A. **52**:163-171 (March) 1954.

Moosnick feels that jaundice rarely constitutes a medical emergency. Certainly less harm is done through erroneously delaying surgical exploration in mechanical obstruction, than would result from surgical intervention in patients with parenchymal lesions wherein changes caused by anesthesia and surgery added to the liver injury might prove fatal or lead to chronic liver disease. Cases of jaundice can be divided into three groups depending on whether the cause lies in the organism generally, in the liver itself, or in the bile passages after they leave the liver and are known respectively as the prehepatic, hepatic, and posthepatic types. The prehepatic type, also known as hemolytic jaundice, results from an overproduction of bile pigments secondary to the excessive destruction of red blood cells. Liver function tests and studies of bile pigment excretion will give normal results. Since this jaundice is due to excessive destruction of red blood cells, anemia is present, but the pigments released by the destroyed blood cells are still bound into a protein complex and fails to pass the renal barrier so that no bile appears in the urine, justifying the term acholuric jaundice. The hepatic type of jaundice is due to disease or injury involving the liver cells themselves and includes hepatitis and cirrhosis. The posthepatic type involves the biliary passages after they leave the liver; it is obstructive in nature and is referred to as surgical jaundice. Classifying jaundice as prehepatic, hepatic, or posthepatic is the basis for diagnosis and the background for therapy. Considerable overlapping of the results of laboratory tests occurs between medical and surgical jaundice. Laboratory studies are not the means of making a diagnosis of jaundice, but rather are a means of confirming or rejecting a working clinical diagnosis. The patient's history is of value in the differential diagnosis in that most jaundice seen in the younger age groups will be of the hepatocellular type or occasionally of the hemolytic variety. Obstructive jaundice due either to stone or to neoplasm is relatively uncommon before the age of 40. Sex is of help in that jaundice due to cholecystic disease or stone is much commoner in women, a ratio of nearly 5:1, whereas jaundice due either to cirrhosis or neoplastic obstruction either in the liver or the head of the pancreas is more frequent in men. Knowledge of the occupation may be of aid. Toxic hepatitis from drug or chemical exposure may be a factor. Housewives may decide to clean furniture or clothing with carbon tetrachloride, or mechanics or other technicians may use it or other toxic solvents to clean machinery parts. Weil's disease should be thought of if the patient is a butcher, sewer worker, plumber, etc. The use of hepatotoxic drugs, alcohol, and blood or blood products should also be investigated. An accurate working diagnosis can be achieved in 75% of cases. Laboratory tests that are dependable in differentiation are bile pigment studies, particularly in the urine early in the course of the disease, the flocculation tests, alkaline phosphatase determination, and the prothrombin response to vitamin K administration. Liver biopsy is the most effective means available in differential diagnosis.

Systemic Lupus Erythematosus: Early Cytologic Diagnosis. E. L. Dubois. California Med. **80**:154-158 (March) 1954.

According to Dubois, systemic lupus erythematosus is relatively common. At the Los Angeles County General Hospital, 44 new cases were diagnosed in 1950 and 1951, as against 88 cases of acute rheumatic fever. Only 18 cases of Hodgkin's disease, 39 cases of acute and subacute leukemia, and 36 cases of pernicious anemia in relapse were observed during this same period. The diagnosis of systemic lupus erythematosus is difficult because of the variable nature of the symptoms, which resemble those of many other conditions. In 1948, Hargraves described the characteristic cell of lupus erythematosus (L. E. cells), and since the introduction of Hargraves' test, which seems to be pathognomonic, it is usually possible to confirm a tentative diagnosis of systemic lupus erythematosus. Dubois describes his own simplified technique for the detection of L. E. cells. In every case in which the disease is suspected, two tests should be made of peripheral blood and one on aspirate from bone marrow, for sometimes the characteristic cells may be found on only one of these tests. After separation of a heparinized sample by centrifuge, a drop from the buffy coat is Wright-stained on a slide and examined for rouleaux formation and for a hematoxylin-staining material sometimes seen in intercellular bodies (which may be surrounded by a rosette of leukocytes) and sometimes seen as ingested by a leukocyte. Only the last finding is positively diagnostic of lupus erythematosus. A statistical analysis of 62 cases treated at the Los Angeles County General Hospital is given. Because of the frequency of rheumatoid-like arthritic changes in the disease, all patients with this form of arthritis should be given the test. Spontaneous remission and then relapse after a long asympto-

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matic interval occurred in many cases. With early diagnosis and vigorous treatment with cortisone and corticotropin, many patients can be relieved of symptoms.

Isoniazid in Treatment of Exudative Pleurisy. A. Carini. Riforma med. **68:**148-153 (Feb. 6) 1954. (In Italian.)

Isoniazid was used to treat 19 patients with exudative pleurisy. The condition was the first clinical manifestation of tuberculous disease in 17 patients and secondary to a specific pulmonary lesion in 2. From 3 to 4 mg. per kilogram of body weight was given with an average total daily dose of 150 to 250 mg. for adults. The drug was given for one or two 25 to 30 day courses with a few treatment-free days between each course. Good effects were obtained in three patients in whom the elevated temperature and erythrocyte sedimentation rate dropped rapidly, the general condition improved, and the exudate diminished progressively leading to a complete recovery in about 20 days. The temperature, general condition, and erythrocyte sedimentation rate were benefited in 11 patients, but in these the pleural exudate remained unchanged, and a definitive recovery was obtained only with thoracentesis and injection of air. The general and pulmonary conditions were not influenced in the other five patients who recovered only after thoracentesis was performed and air introduced. According to Carini, isoniazid, although not the drug of choice for treatment of exudative pleurisy, is more useful than streptomycin, especially if it is used when thoracentesis is performed and air is introduced. This combined treatment not only causes the exudate to disappear but also prevents the onset of pleural adhesions with harmful effects on the respiratory function and, when the pleurisy involves the right side, on the cardiovascular function. Better results can be obtained in treating exudative pleurisy with this method than with administration of streptomycin alone.

Etiology of Lung Cancer: Present Status. M. L. Levin. New York J. Med. **54:** 769-777 (March 15) 1954.

Available evidence regarding the etiology of lung cancer in man points to the existence of multiple causative factors including occupational hazards and cigarette smoking. Known occupational hazards such as chromate production in the United States and illuminating gas manufacture in England do not account for more than a relatively small proportion of cases of lung cancer. The same results obtained by various workers in 13 independent studies present strong presumptive evidence for excess risk of lung cancer attributable to cigarette smoking, being several times that among nonsmokers and accounting for a major part of the incidence of lung cancer, particularly among men. The evidence for excess risk of lung cancer among smokers persists when comparison is made between patients with lung cancer and those with other conditions affecting the lung and bronchi and when the influence of residence and of occupation is equalized in lung cancer and control groups. The available evidence is sufficient to justify public health action in the direction of case finding and public health education to the effect that cigarette smoking must be presumed to play an important role in the production of lung cancer. Additional evidence regarding etiology may be forthcoming from the results of experimental studies but may rest in the final analysis on the study of other possible causative factors found in smokers but not in nonsmokers. At present no such differences are known to explain the excess risk among the former. The weight of the evidence indicates that the relationship between cigarette smoking and lung cancer is causal and not merely an "association." In less than a decade the chance of lung cancer's occurring at some time during life has more than doubled among men in New York state. At the present rate of incidence, lung cancer may be expected to develop in 2% of all men. Since a majority of men are cigarette smokers and most of those aged over 40 have smoked for many years, a good deal of the smoking effect probably has already been exerted. Consequently, no appreciable decrease in rate may be expected in the next decade, even if everyone forthwith gave up smoking. Public health efforts must concentrate on early case finding and on research.

Evaluation of the "Cortisone Test" as a Diagnostic Aid in Differentiating Adrenal Hyperplasia from Adrenal Neoplasia. J. W. Jailer, J. J. Gold and E. Z. Wallace, Am. J. Med. **16:**340-345 (March) 1954.

Animal experiments have demonstrated that one of the physiological effects of cortisone is inhibition of corticotropin secretion by the adenohypophysis. Atrophy of the adrenals was often observed at necropsy in patients who had received large doses of cortisone over long periods of time. The "cortisone test" was performed on 36 patients with adrenal hyperfunction. Of the 36 patients, 14 were female pseudohermaphrodites with virilism caused by adrenal hyperplasia; 6 were boys with macrogenitosomia praecox caused by adrenal hyperplasia; 5 patients had adrenal virilism, secondary to adrenal adenoma in 2 and secondary to adrenal carcinoma in 3; 11 had Cushing's syndrome, caused by adrenal hyperplasia in 6, by adrenal adenoma in 2, and by adrenal carcinoma in 3. The patients were between the ages of 3 weeks and 46 years. The following routine was followed. 1. Daily 17-ketosteroid determinations were performed on 24 hour urine specimens for at least two to four days before the institution of the cortisone test. 2. A dose of 100 mg. of cortisone twice a day was administered intramuscularly for five days. In children the dose was decreased depending on the age of the child. 3. Daily routine collections were continued during the period of administration of the cortisone and for one to two days thereafter. A significant fall in urinary 17-ketosteroids was obtained in all patients with adrenal virilism secondary to adrenal hyperplasia and in most patients with Cushing's syndrome caused by this disorder. A fall in urinary 17-ketosteroids was not obtained in any of the patients with functioning adrenal neoplasms. As a result of their experiences and of those reported in the literature, the authors conclude that the "cortisone test" appears to be useful in differentiating between adrenal hyperplasia and neoplasia. Criteria for its application and interpretation are presented.

Quantitative Evaluation of Primary Adrenal Cortical Deficiency in Man. A. G. Hills, G. D. Webster Jr., O. Rosenthal and others. Am. J. Med. **16:**328-339 (March) 1954.

The authors have devised a method designed to afford a quantitative appraisal of adrenal cortical functional capacity. It consists of a twofold test: (1) a standard metabolic regimen (a low sodium diet i. e., approximately 110 mEq. of sodium and 77 mEq. of potassium, 1,800 to 2,000 calories per day, and daily fluid intake of 2.2 to 3 liters) capable of provoking acute adrenal insufficiency in the severely adrenal deficient person and (2) powerful adrenal cortical stimulation by intravenous administration of 10 I. U. of corticotropin in 1 liter of 5% aqueous dextrose over an eight hour period. Nine patients who had previously undergone subtotal adrenalectomy for severe hypertensive vascular disease, all but two of whom had also been subjected to previous sympathectomy and splanchnicectomy, were studied. Four healthy volunteers and two ambulatory patients who were in no way incapacitated or debilitated served as representatives of the normal corticotropin response. Results suggested that it is possible to classify patients into one of four distinct grades of adrenal functional capacity on the basis of multiple criteria of response to each portion of the test. The criteria to the provocation test were symptoms and signs of adrenal insufficiency (postural hypertension associated with faintness, tachycardia and hyperpnea on quiet standing; lassitude, weakness, anorexia, nausea and vomiting); sodium, potassium, and urea serum values; and electrolyte balances. The criteria to the corticotropin stimulation test were eosinophil count, urinary steroids, and electrolyte balances. It was found that certain adrenal deficient patients present severe adrenal insufficiency during the provocation test (grade O, acorticism); others exhibit symptomatic and chemical evidence of acute adrenal insufficiency of milder degree, yet show little evidence of responding to powerful corticotropin stimulation (grade 1, cortical inadequacy); still other patients manifest no signs of adrenal insufficiency during the provocation test, and respond to corticotropin stimulation, although their response is quantitatively subnormal (grade 2, latent hypocorticism).

Grade 3 is reserved for adrenocortical adequacy with quantitatively normal functional reserve. Intrinsic and extrinsic grounds for confidence in the accuracy of the method are presented. Deliberate induction of acute adrenal insufficiency, however, involves a real potential hazard to the patient; no such study should be undertaken unless the responsible physician is thoroughly conversant with the recognition and management of adrenal crisis.

SURGERY

Management of Traumatic Lesions of the Thorax. H. K. Gray. J. Iowa M. Soc. **44**:108-111 (March) 1954.

The orthopedist and the general surgeon have a correlative responsibility in traumatic lesions of the thorax. The treatment of traumatic shock in injury of the thorax is not different in principle from that in which trauma has occurred elsewhere in the body. Restoration of normal cardiorespiratory physiological processes will, in itself, greatly augment the abolition of shock. In shock caused primarily by hemorrhage, control of the bleeding and immediate restoration of blood by transfusion will usually correct the abnormal state, elevate the blood pressure, and maintain the improvement. In shock caused primarily by trauma, when actual loss of blood in appreciable quantities has not occurred, the beneficial effects of transfusion of whole blood are usually of short duration, and the blood pressure may fall to shock levels at the cessation of what should be adequate replacement. The management of hemothorax, pneumothorax, or the two combined is the commonest problem confronting the admitting surgeon. The accepted treatment is removal of the fluid and air. As much as 1,000 cc. of the pleural contents, if easily obtained, usually can be removed safely at one time. When the patient complains of a "tightness in the chest," a good stopping point has been reached. An orderly plan of regular aspirations should be followed, beginning within the first 24 hours after injury. These should be continued until the pleural space is dry and the lung is completely reexpanded. There is no evidence that early aspiration prolongs or brings about a recurrence of hemorrhage, nor is there evidence that replacement with air is helpful. When a diagnosis of persistent serious hemorrhage has been made, surgical intervention to control the bleeding is the only reasonable method of treatment. The principles of therapy designed to avoid or correct infection in thoracic injury are not essentially different from those designed to avoid or correct infection in the case of trauma elsewhere in the body. A general knowledge of alterations in respiratory physiology is essential if adequate therapeutic procedures are to result beneficially. In many instances of the closed type of pneumothorax with no communication to the atmosphere except through the bronchial tree, simple closed drainage is all that is necessary. The treatment of open pneumothorax with an atmospheric communication through the chest wall is aimed at the immediate correction of the cardiorespiratory imbalance. When the opening in the chest wall is smaller than the opening of the glottis, an airtight dressing over the wound is usually all that is required in the initial or resuscitative phase. When a large open pneumothorax is present, the wound in the chest wall must be closed by a similar dressing or, if this is not feasible, by surgical methods with closed drainage. The negative pressure in the affected hemothorax must be reestablished as soon as possible in order to permit reexpansion of the lung and abolish the "flutter" or "swing" of the mediastinum. A number of ribs may be fractured, and a separation or dislocation of the costocartilaginous or sternocartilaginous articulations may be associated with the fractures. Treatment during the resuscitative phase is aimed at fixing the collapsed chest wall in a stable position. If the injury is unilateral, one can best accomplish this by wide adhesive strapping. If the condition is bilateral or if there is sternal separation or fracture, the chest wall may be suspended by towel-clip traction applied to the costal cartilages or to sternal screws that elevate and maintain their position. Catheter aspiration of the trachea must not be neglected, for an adequate airway must be assured at all times. Regional nerve block relieves much of the pain arising from the site of injury and permits the patient to cough more effectively and to aerate the lung more efficiently than is possible without such block.

Use of Hyaluronidase in Soft Tissue Injury and Its Influence on Experimental Bone Repair. J. J. Gartland and W. R. Mac Ausland. A. M. A. Arch. Surg. **68**:305-314 (March) 1954.

In experiments carried out on 16 rabbits, a constant-sized bone disk was removed from both of the iliac crests of each animal; the graft was stripped of periosteum and replaced and held in position by tantalum wire. The right iliac crest was injected with hyaluronidase, and the left side remained untreated as a control. The animals were killed at 14 days, and the graft areas were studied grossly and microscopically. There did not appear any constant deterrent action on bone repair attributable to hyaluronidase. During a clinical evaluation of hyaluronidase in reducing soft tissue swelling following injury over a three year period, it became apparent that hyaluronidase is a specific agent for definite therapy of hematoma, hemarthrosis, and localized edema, as seen in orthopedic and traumatic surgery. Injection of 1,500 turbidity-reducing units (TRU) of the powdered enzyme in 3 or 5 cc. of 1% procaine hydrochloride, thus giving 300 TRU or 500 TRU to each cubic centimeter of solution, into multiple sites about a swollen ankle or into a hemorrhagic area in any deep muscle, proved its efficacy on many occasions if used early and if combined with the use of an elastic bandage or pressure dressing. Two cases, one in a 42-year-old man with a diffuse hematoma in the left abductor mass after straining his left groin while playing tennis, and the other in a 23-year-old man with proved hemophilia and a large painful hematoma beneath the palmar fascia of the right hand are reported. Injection of hyaluronidase was also used in the treatment of two boys aged 5 and 14 years with fresh supracondylar fractures of the elbow that were complicated by impairment of the distal circulation due to subfascial tension caused by edema and hemorrhage. Injection of hyaluronidase provides the most effective nonsurgical method for treatment of an impending Volkmann ischemic contracture. If the enzyme is used promptly in adequate dosage, operation will be unnecessary. Hyaluronidase if used early and in adequate dosage can prevent the development of myositis ossificans as a complication of soft tissue trauma. Twenty-nine patients with acute hemophilic hemarthroses were treated with hyaluronidase. After the removal of 3 to 4 cc. of the dark viscid blood from the involved joint, 1,000 TRU of hyaluronidase mixed with 1% procaine in an amount equal to that of the blood withdrawn, was injected into the joint, and a snug elastic bandage was applied. Of the 29 patients, the elbow was involved in 10, the knee in 6, the shoulder in 3, and the ankle joint in 10. In 26 patients pain was completely relieved and normal range of motion restored in 48 hours. In three patients the treatment failed for technical reasons in which the action of the enzyme had no part. Seven hemophilic patients with large hematoma and disabling symptoms were also successfully treated with hyaluronidase. Hyaluronidase is the only effective agent in the definite treatment of hemarthroses and hematomas of hemophilia.

Idiopathic Varicose Veins of Upper Extremity. D. M. Clark and R. Warren. New England J. Med. **250**:408-412 (March 11) 1954.

Primary spontaneous varices of the upper extremity are seen so infrequently that they are curiosities. Clark and Warren add two cases of their own observation to the 14 cases that they found in the literature. The first patient was a 21-year-old man hospitalized because of a swelling in each axilla of three years' duration. Surgical exploration revealed no constriction. The anterior scalenus muscle was divided in the hope that the first rib would drop down and relieve possible obstruction to the vein, but postoperatively, there was no alteration in the veins, and during the subsequent three months the patient experienced no relief. The symptoms gradually improved after excision of the right basilic vein. Twenty-one months after

operation, the patient experienced only slight discomfort, and the symptoms in the left, untreated arm also had either improved or became less annoying. The second patient was a woman, aged 27, who complained of discomfort in the right arm of one year's duration. She had noted a nontender mass in the region when she abducted her arm more than 90 degrees. She experienced discomfort, which radiated down the inside of her arm to the hand. At operation the mass was found to consist of a venous sacculation approximately 3 by 2.5 cm. The axillary brachial vein was ligated on each side of the aneurysm, which was then removed. Gross examination showed a bulging segment of vein, 1.9 cm. in diameter and 1.8 cm. long. Microscopic examination revealed a distended, thin vein wall. Nine months later the woman was again admitted complaining of the same symptoms in the left axilla. At operation a situation similar to that on the right was found, except that there were two sacculations. The involved vein was resected. The patient was comfortable for two months after the operation. At a third operation, 6 months later, a sacculation was found in the right axilla. The pectoralis muscle was dissected free of its attachments to the head of the humerus, after which it was possible to ligate the aneurysm flush with the wall of the thorax. Eight months after the third operation there was perfect function. Little can be said about etiology except that occurrence in young persons suggests a congenital weakness of the venous wall. Chronic obstruction at the thoracic inlet as suggested by venography cannot be excluded, but the recurrence on the right side after complete resection in case 2 is a point in favor of the obstruction theory. The authors feel that in their two cases both factors—congenital weakness of the venous wall and partial venous obstruction—were responsible.

Sympathectomy in Raynaud's Syndrome in Hands: After-Examination. L. Hillestad. Tidsskr. norske lægefor. **74:**178-180 (March 1) 1954. (In Norwegian.)

Raynaud's phenomenon, abnormal color changes in the fingers on exposure to cold, is caused by pathologically increased spasm in the arterioles of the fingers on cold stimuli. The spasm leads to complete arterial occlusion with collateral spasm in capillaries and venules. When the arteriole spasm is terminated by heat, the fingers first become cyanotic; then a reactive hyperemia occurs with complete relaxation of the arterioles. In Raynaud's disease with anatomically normal vascular wall, cold as stimulus acts locally on the arterioles and on the sympathetic fibers. The excessive spastic reaction in the vascular wall may be due to local hypersensitivity or to overactive sympathetics. In secondary Raynaud's phenomenon, the vascular wall is abnormal with a diminished lumen that can be occluded by normal vasospastic response to cold. Primary Raynaud's phenomenon is characterized by familial occurrence and is seen mainly in girls at puberty. Between attacks no signs of arterial insufficiency are found. Secondary Raynaud's phenomenon is due to obliterating vascular disease, local arteriole injury, middle-aged female syndrome, nervous diseases, and certain forms of intoxication. Treatment must be directed to the underlying cause. In prophylaxis in Raynaud's phenomenon, chilling of the hands is avoided, vasodilating agents are applied, and in some cases hormone treatment is used. Sympathectomy gives excellent results in the primary form, but not all cases of the secondary group react favorably to it. Of 19 cases, all but one in women, 12 were primary; of the 7 secondary cases, 2 were due to obliterating vascular disorder, 2 to middle-aged female syndrome, 2 to local vascular injury, and one to a nervous disease. Two patients, one with tabes dorsalis and one with grave arteriosclerosis, were not operated on. In 17, denervation of 26 upper extremities was done by the modified Smithwick method. Observation for from six months to eight years showed that good results were maintained, especially in the primary group. In the secondary group obliterating vascular disorders progress independently of the sympathectomy and recurrence depends on the basic disease. The side-effects of the operation are transient dryness of the fingers and increased body temperature. No grave by-effects were observed.

NEUROLOGY & PSYCHIATRY

"Spontaneous" Thrombosis of the Internal Carotid and the Common Carotid: Based on 21 Cases. J. E. Paillas and J. Bonnal. Semaine hôp. Paris **30:**1023-1040 (March 6) 1954. (In French.)

The authors studied the symptoms, physiopathology, and treatment of thromboses of the carotid trunk in 21 cases of their own and 149 cases from the literature. The obliteration is most frequently located at the origin of the internal carotid artery (17 of the 21 cases), less often in the common carotid artery (3 cases), or the intracranial end of the internal carotid artery (1 case); in two patients thrombosis was bilateral. A possible cause is direct injury to the carotid, but usually essential arterial disease, either localized or generalized, is involved, frequently atheroma. Cerebral lesions are usually situated in the sylvian region. The clinical syndrome is marked by a large incidence of premonitory signs and a greater or lesser degree of hemiplegia. Other associated disorders may be aphasia, hemianopsia, epilepsy, and mental deficiency. Ocular disturbances homolateral to the thrombus are of diagnostic value (amaurosis, atrophy, miosis, and low retinal arterial pressure). Compression of the normal carotid may cause cerebral anoxia with malaise and sometimes loss of consciousness. In half the cases, electroencephalograms showed significant evidence of disturbance in the temporal region. Arteriographic evidence is also pathognomonic. A thrombosed carotid alone is insufficient reason to explain the clinical syndrome; poor circulation in the circle of Willis and cerebral angiopathy must also exist. The prognosis depends on the state of these latter disorders and the nature of the arterial disease present. Medical treatment consisting of injections of novacaine and sodium iodide is effective only in the early stages. Various surgical treatments are discussed that aim to supplement cerebrovascular insufficiency, either directly (carotidojugular anastomosis) or sympathetically (arteriectomy, sympathetic ganglionectomy).

Anterior Cingulectomy in Schizophrenia and Other Psychotic Disorders: Clinical Results. P. M. Tow and R. W. Armstrong. J. Ment. Sc. **100:**46-61 (Jan.) 1954.

Anterior cingulectomy as an alternative to frontal leukotomy was suggested by the behavior changes observed in monkeys. Experimental ablations in this region led to marked alterations in emotional behavior. The lesion in the cingulate gyrus is made by suction ablation. The first subjects were severely psychotic patients in whom all other treatment had failed. This report is essentially a description of the effect of anterior cingulectomy on schizophrenic illness, since the few among the 17 patients here reported whose disturbance was not actually identified as schizophrenia had still many features of a schizophrenic nature. Bilateral anterior cingulectomy was followed by a temporary over-all improvement. This lasts three months with an occasional amelioration of conduct persisting for up to 18 months. Two patients with agitated psychotic depression did not respond. No lasting or therapeutically valuable improvement occurs. One patient died. Somatic complications were epilepsy and incontinence; neither was persistent.

Hemispherectomy. H. H. Fleischhacker. J. Ment. Sc. **100:**66-84 (Jan.) 1954.

Hemispherectomy in man was first performed on adult patients with large infiltrating tumors of the subdominant hemisphere. Later it was tried on patients with infantile hemiplegia with epilepsy and personality disturbances. Apart from its value in lessening or curing epilepsy and exerting a beneficial influence on behavior and further mental development, the comparatively small loss of functions after removal of one hemisphere is most remarkable. The author demonstrates this in five patients, all of whom had infantile hemiplegia with low-grade mental deficiency. They all had epilepsy and personality disturbances before operation. All, with one exception, benefited from the hemispherectomy, and none of them is mentally or physically worse after it. From the anatomic pathological point of view, these five patients fall into two groups. Two had cysts

in the distribution of the middle cerebral artery; the other three had more diffuse processes. All patients can speak and dress, are more or less well orientated as to time and place, and have no disturbance of the body image, irrespective of whether their right or left hemisphere was removed. They all can hear equally well in both ears; there is no ataxia or gross disturbance of coordination. None of them shows forced grasping, forced circling, etc. They are all hemianoptic. The sense of smell could not be assessed very well, but it is to be presumed that they have lost it on the side of the operation.

Poliomyelitis IX: Cerebral Hemispheres. A. B. Baker, S. Cornwell and F. Tichy. A. M. A. Arch. Neurol. & Psychiat. **71:**435-454 (April) 1954.

The cerebral hemispheres were studied in 75 fatal cases of bulbar poliomyelitis in an attempt to determine the extent to which the virus of poliomyelitis involves the cerebral cortex and to explain many of the clinical symptoms and signs of poliomyelitis that apparently are not spinal in origin. The histories of the 75 patients showed that 19 had subacute cases and these patients had long periods of hypoxia that lasted 2 to 10 days before the occurrence of death; while 56 had acute cases and these patients gave no evidence of respiratory difficulties. Three types of histopathological changes were observed within the cerebral hemispheres—(1) meningeal inflammation, (2) diffuse and/or focal interstitial cell reaction, and (3) neuronal damage. Meningeal involvement was extremely common and was observed in 64 (85%) of the 75 cases, all cortical areas being implicated in at least some of the cases. This meningeal involvement was invariably mild and bore little correlation to the inflammatory or neuronal changes within the underlying brain tissue. In the 56 acute cases, extensive nerve cell damage was observed in 42 (75%). These neuronal changes were strikingly localized to the large and giant pyramidal cells of layer 5 and the medium pyramidal cells of layer 3 of the motor cortex. Neuronal damage was observed in 15 (79%) of the 19 subacute (hypoxic) cases. The nerve cell damage was more widespread, implicating almost all cortical areas in at least some of the cases. It was felt that the neuronal damage in cortical areas outside the motor cortex in these cases was probably due to hypoxia rather than to poliomyelitis itself. A survey of the histopathological changes throughout the nervous system in 10 unselected cases revealed a most consistent and uniform involvement in all areas exclusive of the basal ganglions, suggesting some uniform method of spread of the infection, such as the vascular system. As a result of their observations, the authors state that one can speak correctly of a polioencephalitis. It is somewhat surprising, in view of the frequent microscopic involvement of the brain, that clinical symptoms referable to the brain are not more frequent and more striking. This lack of clinical evidence of involvement of the motor cortex is probably due to the fact that in none of the authors' cases were more than 15 to 20% of the large motor cells damaged, and in many of these the abnormal changes were reversible. In none of the cases was there enough involvement to produce a spastic hemiplegia or paraplegia, such as was suggested by the studies of Strümpell.

Poliomyelitis X: The Cerebellum: A. B. Baker and S. Cornwell. A. M. A. Arch. Neurol. & Psychiat. **71:**455-465 (April) 1954.

The cerebellum was studied in 75 fatal cases of bulbar poliomyelitis. In 58 (77%) of the 75 cases, at least a minimal amount of inflammatory and/or neuronal change was observed in some areas of the cerebellum. Inflammatory changes within the meninges were observed in 30 cases (40%) and were most frequently found over the vermis. Neuronal changes occurred within all nuclear groups of the cerebellum but were most frequent and severest within the dentate nucleus and the Purkinje layer of the vermis. It is, therefore, apparent that the cerebellum is frequently involved in poliomyelitis, even though clinical manifestations of such involvement are uncommon. The chief reason for the infrequent cerebellar symptoms is the mildness of the tissue changes within the cerebellum. In none of the authors' cases were there ever more than 8% of the cells damaged, and in most nuclear groups the cell damage was less. The distribution of the lesions within the cerebellum emphasizes the tendency of poliomyelitis to attack nerve cells. The widespread alterations observed within all nuclear groups of the cerebellum, as well as the striking damage to the reticular and tegmental cells, speaks against the tendency suggested by other workers that the poliomyelitis virus tends to limit itself to motor cells, except in the severest cases. The widespread lesions within the cerebellum would point to a more diffuse dissemination of the disease process and would emphasize the part played by the vascular system in the spread of this illness.

PEDIATRICS

Bronchial Adenoma in Children: A Case-Report of a 7-Year-Old Boy. D. E. Ward Jr., H. H. Bradshaw and T. C. Prince Jr. J. Thoracic Surg. **27:**295-299 (March) 1954.

A review of the literature prompted by the discovery of a bronchial adenoma in a 7-year-old boy showed only eight previous cases in children under 14 years of age. Two of the eight patients, who ranged in age from 9 to 13 years, were treated by pneumonectomy; bronchoscopic removal of the tumor was carried out in four; and two received no known treatment. The symptoms of bronchial adenoma are generally those of any other type of bronchial obstruction, but, since these tumors present marked vascularity, hemoptysis is especially significant. A definite diagnosis can be established by bronchoscopy and biopsy of the lesion. Adenomas of the bronchi may grow and metastasize as tumors of low-grade malignancy; consequently, they must be regarded as malignant lesions and should be treated by excision of the entire tumor and the surrounding tissues. Lobectomy, or in some instances pneumonectomy, is therefore the treatment of choice for these lesions, because it is the only procedure that can effect a cure.

The Infrequent Incidence of Nonparalytic Poliomyelitis. E. B. Shaw and M. Levin. J. Pediat. **44:**237-243 (March) 1954.

The most characteristic symptom distinguishing poliomyelitis from other central nervous system diseases is a late onset of stiffness in the neck and back, together with soreness and stiffness ("spasm") of the musculature of the extremities. Some residual weakness of the muscles should be expected and searched for in most, if not all, patients, even those who run a supposedly nonparalytic course, because adequate treatment of minor paralysis may prevent the later appearance of severe disability and deformity. Slight imbalance of the spinal, abdominal, and neck muscles may ultimately lead to pronounced scoliosis; minimal weakness of gastrocnemius or anterior tibial muscles with accompanying muscle spasm, muscle shortening, and the overuse of opposing muscles or of substituted muscle action may lead to serious disability, and other apparently mild initial disturbances may be followed by crippling sequelae of varying intensity. Patients should be tested for muscle power before being discharged from the hospital and at intervals for approximately three years thereafter. Analysis of 798 consecutive cases of poliomyelitis seen during a three year period showed that only 31 (3.9%) ran a nonparalytic course. Weakness, once apparent, was objectively demonstrable for two or three months at least in most cases.

Persistence of Neutralizing Antibodies in Human Subjects Three Years After Oral Administration of a Rodent-Adapted Strain of Poliomyelitis Virus. H. Koprowski, G. A. Jervis and T. W. Norton. Pediatrics **13:**203-205 (March) 1954.

Koprowski and associates had established in previous studies that oral administration of a living TN strain of poliomyelitis virus (type 2) to 81 children induced the development of homologous neutralizing antibodies. Serums obtained one month after ingestion of the virus showed the presence of such antibodies without the children's showing signs of poliomyelitis. Serums of 14 of these children were reexamined in the course of the next three years. Before they were given the TN strain,

5 of the 14 were found to possess antibodies against type 1 virus, and one of these had antibodies against type 3 also. Serums of the remaining children were devoid of antibodies against all three types of poliomyelitis virus. Prior studies on the reproducibility of a 50% neutralization end-point of serum samples similarly tested had indicated that fourfold or smaller differences in titer could still represent experimental error and should, therefore, not be regarded as significant. The authors feel that during the period covered the homotypic antibody level remained unchanged in most of the 14 children. Although most of them received multiple doses of the TN strain, three received the virus only once. A persistent immune response to either single or multiple administrations of the virus was demonstrated by the presence of the same titer level of type 2 antibodies in the blood of a number of children for three years and more after original exposure to the virus. It is reasonable to assume that the immunity thus acquired may last beyond the three year period.

UROLOGY

Interrelationship of Renal Cysts and Tumors: Report of Three Cases. T. E. Gibson. J. Urol. **71**:241-252 (March) 1954.

In the first of three patients described by Gibson as illustrating the clinical relationship of cysts and tumors of the kidney, exposure of the kidney for the purpose of nephrectomy suggested the presence of a gigantic solitary cyst, but, after evacuation of a large amount of brownish hemorrhagic fluid, it was found that the wall of the cyst at its attachment to the renal parenchyma was covered with a growth resembling a solidified mass of gelatin that on frozen section proved to be sarcoma. The fact that the patient died one year after operation with evidence of metastases and local recurrence indicates the highly malignant character of this cystic tumor. Although the tumor had a rather uniform structure and was identified as a fibrosarcoma, it had elements of a Wilms's tumor (mesoblastic nephroma). The second patient had a clear cell carcinoma of the right kidney with multiple cysts peripheral to the tumor. In the third patient, a large cystic mass protruded from the upper border of the kidney. On examination of the specimen after removal, the base of the cyst at its point of origin in the kidney was seen to have sessile lesions that on microscopic study proved to be granular cell carcinoma. These three cases and observations reported by other investigators suggest four possible relationships between solitary cysts and malignant tumors of the kidney. They are (1) unrelated origin of cyst and tumor; (2) origin of a cyst within a tumor; (3) origin of a tumor within a cyst; and (4) origin of a cyst distal to a tumor. The presence of a tumor in one pole of a kidney and a cyst in the opposite pole is a fortuitous coincidence. Cystic degeneration within a tumor is exemplified in Wilms's tumors of the kidney. A tumor arising directly from the wall of a solitary cyst (as suggested in point 3) is a possibility, but experiments and clinical material suggest that these usually belong in category 4, because the tumor arises in the parenchyma causing a cyst to form peripherally that later engulfs the tumor and gives it the appearance of arising from the cyst wall. In connection with the cyst that occurs peripherally to a renal tumor, the author says that 30 years ago, while he was investigating the effects of renal tubular obstruction by ligating the papilla of the rabbit's kidney, Hepler, working in the same laboratory, conceived the idea of not only producing tubular obstruction by ligation or fulguration of the renal papilla but also producing ischemia of a corresponding segment of the kidney by occlusion of a branch of the renal artery. Simple tubular obstruction produced tubular dilatation, but combined tubular and vascular block resulted in the formation of a large solitary cyst. Gibson deduced from this experiment that atherosclerotic lesions, tuberculosis, emboli, infarcts, tumors, and the like so situated as to cause tubular block and vascular occlusion could result in renal cyst formation. With regard to the incidence of the association of renal cysts and tumors, Gibson mentions Walsh who reviewed over 500 cases of cystic disease of the kidney and found malignant tumors in 7%. The incidence of associated neoplasm in hemorrhagic cysts was 30%. Solitary cysts of the kidney should never be regarded lightly, but should be explored for possible malignancy.

Adenoma and Tuberculosis of Prostate. A. de la Peña and M. Rodríguez de la Maza. Cir. Ginec. y Urol. **6**:625-629 (Dec.) 1953. (In Spanish.)

Two cases of primary tuberculosis of the prostate associated with adenoma were observed. The clinical and roentgen diagnosis was that of lithiasis and adenoma of the prostate. The operation consisted of a prostatectomy by transurethral resection. The removed specimen showed adenoma and chronic tuberculosis of prostate. No other tuberculous foci were observed. The patient is well four years after the operation. The authors believe that the coexistence of tuberculosis and adenoma of prostate is more frequent than is believed. They advise anatomicopathological examinations of prostatic specimens removed from patients with a clinical and roentgen diagnosis of lithiasis of prostate, as the suspected calculi may often prove to be calcified tuberculous lesions.

OTOLARYNGOLOGY

Otogenic Meningitis. K. McLay. J. Laryng. & Otol. **68**:140-146 (March) 1954.

McLay points out that the incidence of meningitis as a complication of ear diseases has been reduced by the introduction of the sulfonamides and, later, by the introduction of the antibiotic drugs in the treatment of otitis media. He reviews observations on 32 patients with otogenic meningitis who were treated from 1938 until 1952, during the period when the sulfonamides and later penicillin came into wide use. Of the 13 patients who were treated with sulfonamides before penicillin became available, 5 recovered and 8 died; of the 19 treated with systemic and intrathecal administration of penicillin plus systemic administration of sulfonamides, 14 recovered and 5 died. The patients who recovered after receiving the penicillin and sulfonamide regimen included two in whom the disease was complicated by labyrinthitis, two by temperosphenoidal brain abscesses, and one by lateral sinus thrombosis, labyrinthitis, osteomyelitis of the petrous bone, and a cerebellar abscess. Of the penicillin treated patients who died, one had a cerebellar abscess and another had labyrinthitis and a cerebellar abscess. The patients treated with sulfonamides alone included three in whom it was complicated by labyrinthitis and two in whom it was complicated by brain abscesses; all five died. The prognosis of otogenic meningitis has been completely changed by the introduction of the chemotherapeutic and antibiotic agents.

Treatment of Ozena and Rhinopharyngitis Chronica Sicca with Vitamin A. E. Strandbygård. A. M. A. Arch. Otolaryng. **59**:485-491 (April) 1954.

Strandbygård treated rhinitis, pharyngitis sicca, and ozena with vitamin A. The patients received small doses for many years, and the treatment was extremely prolonged. Since 1949 he has used a concentrated synthetic vitamin A preparation, which is available in 1 cc. ampuls of an oil suspension containing 300,000 I. U. or in tablets containing 50,000 I. U. With these concentrated preparations, results were obtained in months that formerly had required years of treatment. Twenty-seven of 35 patients with severe ozena were rendered symptom free in two to three months. A patient with chronic rhinitis sicca and rhinopharyngitis sicca who had a family history of ozena (father, sister, and brother) responded to the same dose of the concentrated vitamin A preparation. On the basis of his experience with vitamin A in the treatment of chronic rhinitis and rhinopharyngitis the author concludes that they have the same pathogenesis as ozena. Experimental studies by Fell and Mellanby confirm this.

Surgery of the Sympathetic in Ménière's Disease, Tinnitus Aurium, and Nerve Deafness: New Concept in Acute Fulminating Ménière's Disease. L. F. Johnson. A. M. A. Arch. Otolaryng. **59**:492-498 (April) 1954.

Johnson presents certain general considerations of the complex entity of Ménière's syndrome and then presents a new concept—that acute fulminating Ménière's disease or acute deafness should be handled as an acute surgical emergency. He observed that in severe Ménière's syndrome there is very little time—perhaps hours, but certainly not days—to effect the de-

sired change in the endolymphatic system, if permanent irreversible deafness is to be averted. He suggests that as soon as severe Ménière's syndrome, characterized by vertigo, nystagmus, tinnitus, nausea, or vomiting, is diagnosed, the stellate ganglion should be blocked with procaine hydrochloride. The two patients in whom the author did this three or four minutes later, as soon as Horner's syndrome appeared, sat up in bed and said they felt well. Both of them walked across the room and sat in a chair; they were free from symptoms. It is conceivable that this interruption of the sympathetic system restores the blood flow and the endolymphatic flow of the labyrinth, relieving the intralabyrinthine pressure and the likelihood of permanent cochlear damage. It appears that cochlear and vestibular deviations are reversible. Having blocked the stellate ganglion in the initial attack, it is Johnson's practice to wait and watch developments. If the patient has a recurrence, the stellate ganglion should again be blocked immediately. After two or three such episodes, dorsal sympathectomy is advised, in which the second, third, and fourth sympathetic ganglions are decentralized. In hundreds of dorsal sympathectomies done at the Massachusetts Memorial Hospitals there has been no fatality. The hospital stay is from five to seven days. It is suspected that dorsal sympathectomy accomplishes permanently what the stellate block accomplishes temporarily. In tinnitus aurium, Johnson blocks the stellate ganglion, and if after a few minutes the tinnitus has disappeared he advises a dorsal sympathectomy. The author has been unable to influence the hearing acuity by sympathetic block in profound deafness from severe Ménière's syndrome and from acoustic trauma. On the other hand, in a few cases of nerve deafness he has been greatly surprised by the response in the patients' hearing to sympathetic interruption. Here again the indications for sympathectomy rest on the hearing improvement following stellate block. The hearing is tested before the block, 5 minutes after the block, and 15 minutes after the block. Since no other therapy offers hope of improving hearing acuity in nerve deafness, dorsal sympathectomy is justified when the hearing improves after stellate block.

THERAPEUTICS

Oral Hydrocortisone Therapy in Bronchial Asthma and Hay Fever. E. Schwartz. J. Allergy 25:112-119 (March) 1954.

Thirty-nine patients with bronchial asthma and 10 patients with ragweed hay fever were given hydrocortisone tablets by mouth. Of the 39 asthmatic patients, 20 obtained excellent relief of symptoms, 5, marked relief, 9, moderate relief, and one, slight relief. Four patients failed to respond. Of the 10 patients with ragweed hay fever, 7 obtained excellent relief, 2, marked relief, and one, moderate relief. In those in whom cortisone had previously been used (24 patients) the response to hydrocortisone given orally was as effective in 15 and superior in 8 patients. One patient failed to respond to both cortisone and hydrocortisone. Significant side-effects requiring discontinuation of therapy were observed in two patients. Side-effects consisted of headache in one and sweating, tachycardia, and dizziness in the other. Mild side-effects were present in seven patients. Forty patients showed no side-effects. Oral hydrocortisone therapy is effective in the symptomatic relief of bronchial asthma and hay fever.

Specificity of Cortisone and Hydrocortisone in Depressing Sensitivity to Tuberculin in Guineapigs. D. A. Long and P. C. Spensley. Lancet 1:645-647 (March 27) 1954.

Studies were made on albino guinea pigs of the Hampstead strain injected with BCG to test the specificity of cortisone, hydrocortisone, and their respective 21-monoacetates in depressing the sensitivity to tuberculin. The drugs were suspended in 1 ml. of isotonic sodium chloride solution and injected subcutaneously six hours before the tuberculin. The response to intradermal injection of tuberculin was taken as a measure of allergic hypersensitivity. Changes in sensitivity were measured in terms of change in potency of standard doses of tuberculin compared with that in control guinea pigs. Single injections of cortisone, hydrocortisone, and their respective acetates diminished sensitivity to tuberculin. No difference was detected in the desensitizing power of these four compounds. Every alteration to the molecule of cortisone and hydrocortisone examined by the authors (apart from acetylation of the 21-hydroxyl group) caused loss of desensitizing power. Because of the proved therapeutic effect of cortisone and hydrocortisone on the rheumatic disease and their depressing action on sensitivity to tuberculin, the analogy between a man with rheumatic disease and a guinea pig sensitive to tuberculin is strengthened. The specificity of the two drugs in relieving symptoms of rheumatic disease and depressing sensitivity to tuberculin suggests that the sequences of biochemical reactions that follow their administration and lead to the two effects may have initial steps in common. Should these steps be identified, a useful advance in the understanding of rheumatic disease and bacterial allergy would be achieved. Since cortisone and hydrocortisone alone among the steroids increase significantly nitrogen excretion and influence markedly carbohydrate metabolism, the authors feel that these are associated phenomena linked to both therapeutic efficacy and desensitizing power. To explain the action of cortisone on tuberculin sensitivity, they say that this steroid interferes with the anabolism of glutathione in the course of a general interference with protein synthesis associated with an increased breakdown of the sulfur-containing and other amino acids. There follows a fall in glutathione that facilitates the oxidation of ascorbic acid to dehydroascorbic acid. This compound inactivates phosphoglucomutase thus blocking the breakdown of glycogen and increasing the tissue concentration of glucose-1-phosphate. It has been proved that glucose-1-phosphate is intimately associated with desensitization.

Effect of Choline on Development and Regression of Cholesterol Atherosclerosis in Rabbits. G. L. Duff and G. F. Meissner. A. M. A. Arch. Path. 57:329-333 (April) 1954.

Duff and Meissner describe a series of three experiments that they undertook to determine the effect of the oral administration of choline chloride on experimental cholesterol atherosclerosis in rabbits. On the basis of these experiments, they concluded that choline even in large doses fails to exert any effect on either the development or the regression of experimental cholesterol atherosclerosis.

RADIOLOGY

Herpes Zoster After Roentgen Irradiation. H. G. Schmitt and F. Thierfelder. Strahlentherapie 93:417-433 (No. 3) 1954. (In German.)

Herpes zoster is caused by a virus that produces a lesion only after the ganglion or the afferent tract has been damaged by some agent. Roentgen irradiation apparently is such a damaging agent. The nine cases of herpes zoster that Schmitt and Thierfelder observed after roentgen irradiation occurred in six patients with carcinoma, one with lichen ruber planus, one with calcaneal spur, and one with tuberculosis of the cervical lymph nodes. Observations on these patients and literature reports indicate that herpes zoster develops chiefly on the side and in the region of the segments that were irradiated. Adjoining segments particularly those in the cranial direction, are frequently involved. The latent period between irradiation and the development of herpes zoster was relatively short compared to that observed by Ellis and Stoll in a much larger number of cases, but it was of about the same length (up to 30 days) as that noted by many in herpes zoster after trauma. The cases of herpes zoster that developed after irradiation of nonmalignant lesions are of interest because (1) the dose administered was relatively small, (2) no toxic action of carcinoma was involved, (3) no surgical intervention had preceded the zoster lesion, and (4) no metastases were present in the vertebral column, a possibility that, in the absence of necropsy, can never be excluded in cases of carcinoma. In the six carcinoma cases reviewed here, no vertebral column metastases existed. In an addendum to this paper, the authors mention eight additional cases of herpes zoster after roentgen irradiation, which came to their attention after completion of their report. All of these eight patients had carcinoma that involved the breast in six.

BOOK REVIEWS

Rh-Hr Blood Types: Applications in Clinical and Legal Medicine and Anthropology: Selected Articles in Immunohematology. By Alexander S. Wiener, M.D., F.A.C.P., Senior Serologist to Office of Chief Medical Examiner of New York City. Cloth. $11.50. Pp. 763, with illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1954.

The author, with the late Karl Landsteiner, was co-discoverer of the Rh factor. Since then he has been one of the main contributors to this rapidly growing subject, which has affected the practice of medicine in various branches and has been applied to nonmedical disciplines such as genetics, anthropology, and general immunology. In the last 13 years Wiener published 261 papers in various journals, most of them on the Rh factor. From this material he selected 69 articles as representative and most important of his contributions to the subject of Rh. Two brief notes by I. B. Wexler, a frequent co-author with Dr. Wiener, and 10 articles on techniques employed in Wiener's laboratory are also included. The articles are divided into 16 groups, including history, fundamental observations and principles, pathogenesis of fetal erythroblastosis, Rh antibodies, Rh-Hr types and their heredity, nomenclature, anthropological aspects, exchange transfusion therapy of fetal erythroblastosis, MNS blood factors, medicolegal applications, ABO incompatibility in pregnancy, autoantibodies, and blood transfusion techniques. There is a complete bibliography of Wiener's works. There are well-organized and complete author and subject indexes. Wiener has been for several years in the center of a controversy regarding the heredity of the Rh-Hr factors and their nomenclature. This volume contains all the essential arguments that he has gathered in support of his views.

An Rh-Hr Syllabus: The Types and Their Applications. By Alexander S. Wiener, M.D., F.A.C.P., F.C.A.P., Senior Bacteriologist (Serology) to Office of Chief Medical Examiner of New York City. Modern medical monographs, 9. Cloth. $3.75. Pp. 82, with 9 illustrations. Grune & Stratton, Inc., 381 Fourth Ave., New York 16, 1954.

This is a companion volume to the monograph entitled "Rh-Hr Blood Types." It contains definitions and descriptions of a large number of items relating to the Rh factor and its various applications. The subjects treated include fundamentals, Rh antibodies, serology and genetics of the Rh-Hr types, erythroblastosis fetalis, blood transfusion, autosensitization, anthropological aspects, and medicolegal applications. There is a well-organized index. The author presents a succinct summary of his views on the subject, to which he has devoted his entire scientific career and in which he is a recognized authority. Some of the views are one-sided and are not shared by many writers. They include, among others, Wiener's conception of the inheritance of Rh factors and his ideas about so-called conglutinins. Wiener has been championing his views with great vehemence and tenacity for many years, and it is only natural to have included them in this monograph, which can be recommended as a faithful presentation of the views of this outstanding investigator.

Calderwood's Orthopedic Nursing. Revised by Carroll B. Larson, M.D., F.A.C.S., Professor of Orthopedic Surgery and Chairman of Department of Orthopedic Surgery, State University of Iowa, Iowa City, and Marjorie Gould, R.N., B.S., M.S., Supervisor of Orthopedic Nursing, State University of Iowa. Third edition. Cloth. $5.75. Pp. 687, with 284 illustrations. C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, 1953.

This textbook on orthopedic nursing attempts to bring together in one volume the background of medical information and nursing techniques necessary to assist the nurse in caring for the orthopedic patient. The book is not intended to take the place of a comprehensive reference text on orthopedic surgery. The authors emphasize established principles. In preparing this edition, old material has been reorganized to keep the context abreast of progress in orthopedic surgery. Increased emphasis has been placed on rehabilitation. New surgical procedures and the nursing care that must follow have been included. The new illustrations help the student to identify orthopedic apparatus, clarify nursing care, and assist the nurse in giving the best care possible to the orthopedic patient. The book is divided into 15 units, each of which is followed by questions for study and a reference list. A glossary of terms is included at the back of the book. This book admirably accomplishes its objectives and should serve as an excellent reference text. The emphasis is on nursing care, and much attention is given to stimulating an understanding of the nurse's role in the care of the orthopedic patient. Instructors should find it a valuable aid in their teaching.

History of the Second World War: United Kingdom Medical Series. Editor-in-chief: Sir Arthur S. MacNalty, K.C.B., M.A., M.D. The Royal Naval Medical Service. Volume I: Administration. By Surgeon Commander J. L. S. Coulter, D.S.C., R.N., Barrister-at-Law. Cloth. 50s. Pp. 512, with illustrations. Her Majesty's Stationery Office, P.O. Box 569, London, S.E.1, 1954.

This volume of the British medical history of World War II, pertaining to the Royal Naval Medical Services, covers the supply of medical equipment to the fleet, personnel problems, the activities of hospitals and hospital ships, the Navy's blood transfusion service, scientific research in marine medicine, and dental work of the Royal Navy. "Sick Berth Branch," which is that section of the medical branch of the Royal Navy devoted to nursing and medical administrative duties, had 327 of its members lose their lives during this war. The chapter on Queen Alexandra's Royal Naval Nursing Service states that 1,341 nursing sisters served in the Royal Navy during the war. In this group, marriage rather than sickness was the greatest cause of wastage. During the war 327 nursing sisters married and retired. This, the editor said, "is a tribute to the charm of the service as a whole." Deaths due to enemy action in this group of women numbered only two: one sister was enroute to Gibraltar in a troop ship that was torpedoed with the loss of all on board; the other sister was escorting a sick patient to the United Kingdom on a plane that was shot down. Numerous other sisters were on ships that were sunk, but all of them were eventually rescued. Altogether about 100,000 women served in the Woman's Royal Naval Medical Services during the war.

The Royal Navy had 11 hospital ships to which a total of 93,142 patients were admitted. His Majesty's hospital ship Vita had some terrifying experiences. Arriving at Tobruk in April, 1941, she took on 328 army casualties and 63 Australian army nursing sisters, who were disembarked at Haifa a few days later. The Vita promptly returned to Tobruk and took on 430 army casualties. On leaving Tobruk that afternoon, the Vita was "deliberately" attacked by nine German aircraft and was so damaged that by midnight all patients had to be evacuated to H.M.A.S. Waterhen. Shortly the Vita again was attacked by enemy airplanes and had to be towed away from Tobruk to Port Said and conducted through the Suez Canal to Port Tewfik, where she was partly repaired. Now on one engine only, the Vita undertook a long, arduous voyage to Bombay for a long period of repair. Again returned to full duty, on April 8, 1942, she was bound for Addu Atoll in the Pacific when she passed H.M.S. Hermes and Vampire steaming in the opposite direction. A half-hour later the two warships were attacked by 50 Japanese airplanes, and they sank within a few minutes. The Vita turned about and, while the Japanese planes were still attacking, picked up 595 survivors. In contrast to the German attack on this ship at Tobruk, it is recorded that the Japanese attack ceased when the Vita arrived and that due respect was accorded to the Red Cross.

In the following chapter it appears that 238,925 donors were bled by or on behalf of the Royal Naval Blood Transfusion Service.

In the discussion of syphilis in the chapter on preventive medicine, the most serious problem is said to have been the loss of medical histories and forms when one of the British ships

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These book reviews have been prepared by competent authorities but do not represent the opinions of any official bodies unless specifically so stated.

was sunk. This meant that a number of men would report for continuity treatment of whom the past clinical details were no longer known, while other men, knowing of the loss of their medical history, would take advantage of the fact and default permanently. Thus it was impossible to carry on efficient continuity of the treatment for syphilis. The Navy devised a system of duplicate records, one of which the man himself was to carry on his person at all times. Even this did not solve the problem, as the man sometimes lost his card. The problem was eventually solved by establishing a central register of syphilis. The Navy soon realized that penicillin exerted a lethal effect on both gonococci and Treponema pallida; this at first seemed to be a great advantage but later was shown to be a disadvantage, for when both diseases were contracted at the same time, the incubation periods being different, a curative dose of penicillin in gonorrhea might inhibit the growth of T. pallidum and thus mask syphilis, which would show up at a later time. This observation has been made repeatedly elsewhere since the war.

Atlas of Exfoliative Cytology. By George N. Papanicolaou, M.D., Ph.D. Cloth, loose-leaf. $18. Various pagination, with 36 colored plates. Published for Commonwealth Fund by Harvard University Press, Cambridge 38, Mass., 1954.

This descriptive loose-leaf atlas contains illustrations, largely drawings in color, of various cells desquamated from normal or neoplastic epithelial surfaces. The position of this field of study is given in the author's preface. The desquamated (exfoliated) cells "because of their separation from their site of origin undergo retrogressive changes and acquire specific morphologic characteristics. Such cells are free from the pressure of surrounding cells and often assume distinctive forms differing markedly from those of the same type as they appear in tissue sections or those obtained by microdissection or scraping. . . . Should one attempt to describe and illustrate the myriads of normal and abnormal cellular forms found in body fluids, he would be faced with an impossible task." The atlas is arranged in sections with descriptions and plates, of which 12 plates are allotted to the female genital system; 4 to the urinary and male genital organs; 5 to the respiratory system; 5 to the alimentary tract; 2 to the pleural, peritoneal, and pericardial exudates; 2 to breast secretions; 1 each to histiocytes, cells related to pregnancy, cells affected by radiation, and multinucleated cells of various types; and, finally, 2 to mitotic figures found in normal and malignant cells. Twenty-four of the color plates are drawings and twelve are photomicrographs.

"Errors resulting from misinterpretations of cytologic findings are to be expected. . . . Detached cells cannot be identified as to their origin and type with the same accuracy as cells in situ, and therefore the general and diagnostic significance of many types of exfoliated cells is still incompletely understood." These comments by the author clearly indicate the shortcomings of the exfoliative cell system of examination when directed toward the detection of cancerous tissues. The procedure is at best a screening process, and normal findings can be as valueless as the abnormal are considered significant, because a tissue biopsy, when the lesion is accessible, is finally required for diagnosis. The clinician demands an unequivocal answer from the pathologist, and when an organ is removed or a patient is treated for a cancerous growth, the pathologist will rise or fall on the accuracy of his diagnosis. The histological examination of small pieces of tissue has been done by pathologists for many years, as has the examination of sediments of many tissue fluids; the standards for evaluating the cells and cell masses in these materials are established by the structure of the tissues in the primary growth. Rarely, if ever, is a pathologist willing to make a diagnosis of cancer on the basis of the structure of a single cell. He needs to know not only the structure but also the grouping in masses of these cells.

The illustrations are beautifully reproduced, but many with legends describing cells as cancerous are equivocal. Too much of the caption material is nebulous. To those who have a great interest in this form of cytological study the atlas is especially valuable.

A Doctor Talks to Women: What They Should Know About the Normal Functions and Common Disorders of the Female Organs. By Samuel Raynor Meaker, M.D. Cloth. $3.95. Pp. 231, with 12 illustrations. Simon and Schuster, Inc., 630 Fifth Ave., New York 20, 1954.

In the preface of this book the author points out the growing interest in medical matters, which he considers to be good. To meet the demands of the laity much has been written in magazines and books or broadcast on the radio and television. Some of the material is wholly inaccurate, some is purely sensational, and much encourages self-diagnosis and self-treatment. Dr. Meaker has attempted to assemble the information about gynecology and related subjects that he believes is most likely to be wanted. Among the subjects discussed are the female organs of reproduction, the change of life, absent or insufficient menstruation, abnormal bleeding, painful menstruation, conception and the beginning of pregnancy, fertility and sterility, sex relations, planned parenthood, imperfect development of the female organs, cancer, the breasts, operations, douches, treatment with hormones, and the influence of the mind on the body. The author has succeeded in his attempt, for the book contains much useful information and is written in a lucid style by an authority on the subject. Interest is maintained throughout the book. This book can be recommended to all women not only because it is full of useful facts but also because it is delightful reading.

The Billroth I Gastric Resection with Particular Reference to the Surgery of Peptic Ulcer. By Horace G. Moore, Jr., M.D., and Henry N. Harkins, M.D., Ph.D., F.A.C.S., Professor of Surgery and Executive Officer of Department of Surgery, University of Washington School of Medicine, Seattle. With foreword by Dr. Gösta Bohmansson, and preface by Dr. John M. Waugh, Head of Section in Division of Surgery, Mayo Clinic, Rochester, Minn. Cloth. $7.50. Pp. 175, with 49 illustrations. Little, Brown & Company, 34 Beacon St., Boston 6, 1954.

This monograph is based on a careful study of 140 consecutive Billroth 1 gastric resections performed at the King County Hospital in Seattle. As a result of this study and a consideration of the literature, the authors are convinced that the Billroth 1 operation is, in general, superior to the Billroth 2 method and should be used whenever the stomach must be resected in the treatment of gastric or duodenal ulcer or, in some cases, of gastric carcinoma. They point out that with free mobilization of the duodenum the operation is much more widely feasible than has generally been supposed. They believe that the discharge of gastric content into the duodenum is much more physiological than discharge into the jejunum, as is the case with the Billroth 2 procedure. The volume is beautifully illustrated, and the drawings should be of distinct service to surgeons who are not already familiar with the Billroth 1 method. One of the most valuable sections of the book is a fairly complete discussion of the postgastrectomy or dumping syndrome. The authors believe that this is less marked after the Billroth 1 procedure. At the close of the book short biographical sketches are provided of a number of leading gastric surgeons.

Mother and Baby Care in Pictures. By Louise Zabriskie, R.N., Director, Maternity Consultation Service, New York City. Fourth edition. Boards. $3. Pp. 244, with 255 illustrations. J. B. Lippincott Company, 227-231 S. Sixth St., Philadelphia 5; Aldine House, 10-13 Bedford St., London, W.C.2; 2083 Guy St., Montreal, 1953.

This volume, like the three previous editions, is designed to tell the story of human reproduction and the care of the baby by numerous carefully selected illustrations and a minimum of discussion. The prenatal period is discussed with particular emphasis on the physiological, psychological, and emotional factors in pregnancy. Preparation for childbirth in the form of education for the parents is emphasized. To this end, exercises for the mother, the growth and development of the baby, the mechanism of its birth, and the delivery are profusely illustrated and described. More than half of the book is devoted to preparations for the baby, its care in the hospital and at home during the first few weeks of its life, and growth and development during its early years. This popular book should continue to hold the interest of parents and can be read profitably by everyone who is interested in modern obstetric care.

QUERIES AND MINOR NOTES

GASTRIC AND DUODENAL ULCERS

TO THE EDITOR:—*In chronic ulcer patients who have never been operated on why do not many ulcers develop, as there certainly is room to accommodate them all? Why does not ulcer no. 2, which is expected after the surgical excision of ulcer no. 1, not occur during the lifetime of ulcer no. 1? Is there any evidence that having one ulcer tends to prevent the evolution of succeeding ulcers?*

Bruce Cominole, M.D., Daytona Beach, Fla.

This inquiry was referred to two consultants whose respective replies follow.—ED.

ANSWER.—It is true that the usual patient with chronic peptic ulcer has a single lesion. Simple excision of a duodenal or gastric ulcer has been employed occasionally, but, as with the apparent healing of ulcer by medical management, recurrence is likely. Hypermotility, hyperactive secretion of digestive juices, turgescence of gastric mucosa, and other etiological factors persist and tend to cause trouble. Simple closure of a perforated ulcer of the duodenum is eventually followed by recurrence in more than half of the patients. Gastroenterostomy is frequently followed by development of a new ulcer in the jejunum near the stoma. Gastrojejunostomy with the stoma near the pyloric sphincter and with complete vagotomy to decrease hypermotility, hyperacidity, and turgescence is rarely followed by recurrence. Subtotal gastrectomy with removal of the pylorus with its peristalsis and of a variable amount of the fundus, restoring continuity by gastrojejunostomy, is also associated with a new ulcer of the jejunum in about 5% of patients. Some surgeons are now combining vagotomy with subtotal gastrectomy and gastrojejunostomy, apparently with lessening of risk of recurrence but probably with increase of the postoperative dysfunctions and disability associated with vagotomy and gastroenterostomy or with resection alone. Patients for whom surgery is indicated usually have a stronger ulcer diathesis than those whose ulcers are controlled by medical management.

With gastroenterostomy, with vagotomy and gastroenterostomy, and occasionally with subtotal gastrectomy where an exclusion procedure is advisable the original duodenal ulcer is not removed. There is no evidence in these patients that the original ulcer, which usually heals, protects against the development of a jejunal ulcer.

Internists, surgeons, and physiologists also wonder why more persons do not have ulcer or why ulcer patients do not have multiple ulcers more frequently. Undoubtedly, more ulcers occur than can be recognized clinically or roentgenologically. These may heal without producing characteristic deformity. One chronic ulcer, producing symptoms, usually causes the patient to follow a treatment program. Perhaps the treatment is the factor that decreases the incidence of multiple chronic ulceration.

ANSWER.—It is quite true that most patients with duodenal ulcer have a single lesion. The fact that another ulcer usually forms if the original one is simply locally excised is only a part of the evidence that indicates that the cause of the original lesion is not a local decrease in the resistance of the mucous membrane to the digestive action of the gastric content. Almost all of the experimental evidence of recent years indicates that the lesion is due rather to an increase in the corrosive properties of the gastric content, which in turn is due to a hypersecretion of gastric juice. Dragstedt believes that this hypersecretion is of nervous origin and has advocated division of the vagus nerves to the stomach to abolish it. There is no good evidence that the presence of one ulcer tends to prevent the evolution of succeeding ulcers. It is possible, however, that the discomfort of the original lesion prompts the patient to undertake modifications in the diet and to ingest alkalies, which, although they may be ineffective in curing the original ulcer, nevertheless, prevent additional or new ulcers from forming. A duodenal ulcer that produces pyloric stenosis with gastric stasis may through this mechanism give rise to a secondary gastric ulcer. In this case, also, the aggressive action of the gastric content rather than local decrease in resistance is the cause of the ulcer.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any official bodies unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

DIABETES MELLITUS

TO THE EDITOR:—*A 43-year-old woman believes that a certain person has been trying to poison her. Studies during hospitalization disclosed that diabetes mellitus was present and no other abnormality. Six months ago this patient's urine was examined when she applied for employment at a local factory and was reported negative for sugar. Has diabetes mellitus ever been reported as a result of administration of drugs or poisons?* *M.D., Connecticut.*

ANSWER.—Alloxan will cause diabetes in animals by destroying the beta cells in the islands of Langerhans. It has so many side-effects that it is questionable if it would produce diabetes in humans without causing the person affected to die promptly from injury to other organs such as the kidneys. When the beta cells are too numerous, as in an adenoma of the pancreas, alloxan has been employed to destroy them, but the dangers of its administration have been so great that surgical removal of the adenoma has been considered safer. Corticotropin (ACTH) will produce glycosuria and hyperglycemia, but the temporary diabetes is characterized by complete reversibility. In one case in which the diabetes was latent before the administration of the corticotropin the glucose tolerance test was abnormal one year after injections were omitted. Thallium, used as a poison for rats, eventually may cause glycosuria and hyperglycemia lasting many weeks, but a major symptom, which exists at the same time from the third to the tenth week, is the falling out of the hair, which grows again, and the diabetic symptoms fade. Observations along this line have been published by dermatologists who have used thallium as a depilatory and Prof. J. Hoet of Louvain, Belgium, tells me that he expects soon to record a medicolegal case. Phlorhizin will cause glycosuria without hyperglycemia and therefore no diabetes.

TREATMENT OF BRUCELLOSIS

TO THE EDITOR:—*Please give the dosage and length of time recommended for the treatment of chronic brucellosis with chlortetracycline (Aureomycin) or tetracycline (Achromycin).*

Robert M. Catey, M.D., Oregon, Ill.

ANSWER.—For the treatment of the mildly to moderately ill patients having either acute or chronic brucellosis, chlortetracycline (Aureomycin) or oxytetracycline (Terramycin) has yielded satisfactory results. A recommended dosage schedule is 0.5 gm. four times a day for 21 days. There is every indication that tetracycline (Achromycin) is as effective as either chlortetracycline or oxytetracycline. Since tetracycline provokes fewer side-effects, it should be tried instead of the other two. For the more seriously ill patient with undoubted acute or chronic brucellosis, a combination of dihydrostreptomycin or streptomycin is advocated with either tetracycline, chlortetracycline, or oxytetracycline. A recommended dosage schedule is 1 gm. of dihydrostreptomycin or streptomycin given intramuscularly every 12 hours for one week, then 0.5 gm. of either drug given for an additional week. Simultaneously chlortetracycline, oxytetracycline, or tetracycline may be given in a dose of 0.5 gm. four times a day for 21 days.

SEDATION IN A TWO-YEAR-OLD CHILD

To the Editor:—*1. Can the type of opiate administered hypodermically be determined by a urine examination? 2. Is the spectrum test accurate as to the type of opiate in the urine? 3. If an opiate is discovered in the urine, should there also be evidence of it in the brain cells? 4. If a 2-year-old child is given a grain (60 mg.) of secobarbital (Seconal) by rectum preoperatively, given inhalation vinyl ether and ether, then an hour later given a quarter of a grain (15 mg.) of morphine, would these drugs be a lethal dose of sedatives and how long would the child survive if a quarter of a grain of morphine is lethal? 5. What is the lethal dose of morphine for a 2-year-old child? 6. Could a quarter of a grain of codeine administered one hour after the anesthetic produce opiate poisoning and what is the lethal dose of codeine for a 2-year-old child? It seems to me that, if opiate poisoning was the cause of death, the child would have died within two hours after administration of the quarter of a grain of morphine. The child lived 18 hours. I contend also that codeine with a grain of secobarbital would cause death in a 2-year-old child.*

M.D., California.

Answer.—1. Yes. 2. Morphine may be determined spectrophotometrically, since it has an absorption maximum at 285 mμ (Grant, E. W., and Hilty, W. W.: *J. Am. Pharm. A.* (Scient. Ed.) **42**:150-152, 1953). 3. An opiate may be found in the urine but not in the brain; this is probably due to the extreme difficulties in analytical procedures. 4. In view of the fact that the grain (60 mg.) of secobarbital (Seconal) and the quarter of a grain (15 mg.) of morphine are definitely adult doses, it would be my opinion this combination would represent overdosage as far as a 2-year-old child is concerned. 5. The lethal dose of morphine for a 2-year-old child is decidedly a variable factor, and no absolute figure can be given. 6. A quarter of a grain of codeine is distinctly an adult dose, and in combination with the barbiturate and ether could be expected to produce very marked depression. The argument that the combination of codeine and secobarbital is more depressant than morphine and secobarbital is not valid, since morphine is five to six times as active as codeine. It could be expected that both codeine and morphine, plus the secobarbital, would produce very marked depression. There is no reason to expect that a child would die within two hours after ingestion of a grain of secobarbital and a quarter of a grain of morphine. Secobarbital, ether, and morphine or codeine are synergistic in their depressing effects, and certainly depression would be greater with morphine than with codeine.

TEST TO DETERMINE KIDNEY DAMAGE

To the Editor:—*A patient has had some hemorrhage from the right kidney for four weeks following an accident. Retrograde pyelography showed a nonfunctioning atrophied left kidney, of long standing, probably 26 years. Results of urinalysis had been normal to the time of the accident. What tests are advisable to determine the damage to a kidney by an accident?*

A. C. King, M.D., Chicago.

Answer.—The degree of renal damage as a result of trauma may be demonstrated graphically by retrograde pyelography. Function of an individual kidney can be studied by excretory urography or phenolsulfonphthalein excretion. Although the primary purpose of excretory urography is to provide roentgenologic visualization of the urinary tract, this procedure has the added advantage of serving as a gross test of renal function of the individual kidney. In performance of this test a roentgenogram is exposed five minutes following intravenous administration of the commonly employed urographic medium. If sufficient medium is present in the pelvis and calyces to cast a strong contrasting shadow in the roentgenogram, it may be assumed that renal function is adequate. If the appearance of the medium in the kidney is delayed and the shadow cast in the roentgenogram faint, it may be assumed that the function of that kidney is impaired. Some of the factors that must be considered in attempting to evaluate renal function on the basis of excretory urography are the size of the patient, the state of his circulation and degree of hydration, the presence of gas and fecal material in his bowels, and the technical factors involved in making roentgenograms.

Quantitative determination of the function of the individual kidney can be made by the phenolsulfonphthalein test. This test is preceded by cystoscopy and passage of ureteral catheters to each kidney. One cubic centimeter of a sterile solution of phenolsulfonphthalein is injected intravenously, and the urine is collected in test tubes that contain sodium hydroxide (10%). Normally the dye begins to be excreted in the urine two to six minutes after its injection. Fifteen to 20% of the dye is excreted by each kidney during the first 15 minutes and 25 to 30% during the first 30 minutes after injection. Inaccuracies may result from faulty placement of catheters, leakage of dye into the bladder alongside the catheters, and temporary renal inhibition.

Determination of total renal function should be made in the case described above. The following tests are extensively employed to study renal function: (1) excretory urography, (2) estimation of nitrogen retention in the blood (urea nitrogen, nonprotein nitrogen), (3) phenolsulfonphthalein test, (4) urea clearance test, and (5) concentration and dilution tests. It is advisable to employ excretory urography and at least one other test of renal function in each case. More refined tests of renal function, such as inulin and iodopyracet (Diodrast) clearance, are not practical for general use.

TREATMENT OF OSTEOARTHRITIS

To the Editor:—*Is there a non-narcotic injectable fluid that can be given subcutaneously or intramuscularly for control of pain in the back (osteoarthritis)? I have had fair results with methadone in solution but I would like to switch to a non-narcotic agent.*

M.D., New York.

Answer.—The inquirer is urged to make a careful reexamination of the patient to determine whether some condition other than osteoarthritis may be present. Pain associated with chronic osteoarthritis rarely becomes severe enough to require use of narcotics, and a history such as suggested by this question may indicate that some neoplasm is responsible. In the event that this patient is indeed suffering with osteoarthritis the use of narcotics should certainly be discontinued; otherwise the patient may very well soon become addicted.

Lesions of osteoarthritis are permanent and must be expected to remain throughout life. The predominant pathological lesions affect cartilage and margins of articular bone and are of such a nature that neither regeneration nor regression are possible. In view of these aspects of osteoarthritis, treatment for this condition should have two goals: first, to alleviate symptoms and, second, to prevent progression of the underlying pathological lesions.

Measures of treatment that have been found useful include reassurance of the patient, rest, physical therapy, removal of traumatizing factors such as abnormal postures of walking, standing, or work, and employment of orthopedic appliances and supports, as well as certain medicaments. Roentgen therapy, removal of infectious foci, gold therapy, and hormones are not believed to be of primary importance in treatment schedules for osteoarthritis.

Reassurance is a most important therapeutic measure for osteoarthritis sufferers, inasmuch as symptoms of this condition frequently resemble symptoms of the more devastating form of chronic arthritis, rheumatoid arthritis. Hence, patients with osteoarthritis frequently assume that they are confronted by a hopeless situation and suffer greatly from anxiety. Efforts should be made by the controlling physician to relieve this misapprehension by means of thoughtful discussions and explanations.

Rest and physical therapy may be employed with considerable advantage in treatment of osteoarthritis. Judicious planning for rest periods and avoidance of traumatizing exercises may very well delay progression of the pathological phenomena. In general each day should have a few hours set aside for complete rest and conditions of work and requirements of daily travel should be examined carefully with a view to minimizing trauma in every possible manner. Unnec-

essary weight-bearing should be eliminated; obesity should be overcome with dieting; and abnormal posture should be corrected with corsets and well-balanced shoes.

Under the heading of physical therapy a program of treatment for osteoarthritis should include applications of heat and massages. These may be expected to bring to most patients a worth-while degree of relief. Warm baths, hot water bottles, infrared bulbs, and hot compresses may serve as sources of heat. Exercises have no place in the treatment of osteoarthritis and should be avoided by physical therapists lest the wear and tear of affected joints be accelerated.

As to medicaments, none thus far tested have been shown to limit or heal osteoarthritic lesions. However, medicaments that relieve pain or aid in securing rest through mild sedation are regularly useful. Aspirin or sodium salicylate serve well as analgesics. Phenobarbital is generally satisfactory as a sedative.

Both male and female sex hormones have been studied as treatment measures for osteoarthritis but neither has stood the test of time. A possible role for adrenocortical hormones or corticotropin (ACTH) is still being sought; however, these agents are not today regularly helpful in the long-term program of therapy for patients with osteoarthritis.

USE OF ESTROGENS IN POSTMENOPAUSAL PATIENTS

To the Editor:—*Certain authorities differ as to the value of estrogens and androgens for postmenopausal patients. What is the prevailing opinion?* *M.D., Michigan.*

Answer. Estrogens are specific for the relief of menopausal symptoms, but they may also be relieved by other hormones, barbiturates, suggestive therapy, and other means. Furthermore, in spite of the fact that estrogens can alleviate more of the symptoms of the menopause, some women with menopausal symptoms should not be treated with estrogens. This group includes those who have had a cancer of the breast or other cancer removed, women who have been castrated surgically or by irradiation for endometriosis, and women who bleed after the use of estrogens. In the cancer group there is slight risk of a recurrence of the neoplasm. In women who have had endometriosis, estrogens can readily reactivate any remaining endometriotic tissue, and in the women who bleed after estrogen therapy there is not only blood loss to be considered but also uncertainty as to whether a neoplasm is present. Unfortunately, uterine bleeding is produced by estrogen therapy in many women in the menopause. Naturally in women past the menopause cancer of the endometrium should be suspected, and this cannot be ruled out definitely except by curettage. Therefore, injudicious use of estrogens for menopausal symptoms will lead to many unnecessary operations. On the other hand, some instances of carcinoma of the uterus will be overlooked until too late because physicians may assume that the bleeding that follows estrogen therapy is due to the medication and not to a neoplasm.

Women who cannot tolerate or should not be given estrogens because of previous cancer or endometriosis can obtain some relief from the male hormone. From 10 to 25 mg. of testosterone propionate may be given hypodermically once or twice a week for four weeks. Methyltestosterone taken orally (10 to 20 mg. every day) or testosterone buccally (5 to 10 mg. daily) is preferable to hypodermic injections and less expensive. For some patients in whom bleeding results from the use of estrogens, a combination of estrogen and androgen is useful. Usually 5 to 10 mg. of methyltestosterone or 5 mg. of testosterone buccally is prescribed with each 0.25 mg. tablet of diethylstilbestrol or a tablet containing both hormones. Many women given androgen therapy in the menopause find that the hormone acts as a tonic and prevents or overcomes fatigue.

The advantages of estrogens and androgens used concomitantly include: (1) their synergistic inhibition of the excessive hypophyseal gonadotrophic hormone secretion held to cause many menopausal disturbances; (2) the smaller doses made possible by combined therapy, which reduces danger of overdosage disturbances from both types of substances alone; and (3) the androgens' inhibitory action on the pathological endometrial and mammary proliferation caused by estrogens and the estrogens' inhibitory action on androgen viriligenic action. In women who have bony metastases following radical mastectomy for carcinoma, large doses of androgens and estrogens reduce the pain and delay death in many cases. Unlike the favorable responses that occur to androgen therapy in women of any age after removal of carcinoma of the breast, the best results with estrogens are observed in women at least five years postmenopausal.

TRICHOMONAS HOMINIS

To the Editor:—*I would like to know the treatment for diarrhea caused by Trichomonas hominis. We see quite a few cases of this nature in south Texas, bordering Mexico.*

M.D., Texas.

This inquiry was referred to two consultants, whose respective replies follow.—Ed.

Answer. — Many parasitologists doubt that Trichomonas hominis is pathogenic and question whether their presence in the stool or duodenal contents constitutes an adequate explanation for diarrhea. However, many textbooks on tropical medicine refer to "flagellate dysentery" and mention this organism. A great many types of treatment have been recommended. Manson-Bahr suggests the irrigation of the colon with 2% sodium bicarbonate solution and the concurrent administration of 4 grains (0.25 gm.) of acetarsone for about 10 days. Other arsenical compounds such as carbarsone have also been employed. Shookhoff (*Bull. New York Acad. Med.* **27**:439 [July] 1951) reports that chlortetracycline (Aureomycin) is effective against most of the colonic protozoa including T. hominis, and quotes other workers who found that oxytetracycline (Terramycin) failed to eradicate the parasites. Probably the combination of an antibiotic with one of the arsenical compounds would constitute effective treatment in a majority of cases.

Answer.—The treatment for Trichomonas hominis in the bowel is the same as for treatment in the urinogenital tract. The patient should take 250 mg. of chlortetracycline (Aureomycin) four times a day for one week. With each dose of chlortetracycline, the patient should take 2 drachms (8 cc.) of elixir of Rubraton (containing vitamin B_{12}, folic acid, and ferric ammonium citrate). After a week's treatment with the chlortetracycline, administration of Rubraton should be continued for five days, four times a day. At the end of this time, the patient's stool should again be tested for T. hominis and the organism should have disappeared with this management. If not, treatment may be repeated.

FASTING HYPERGLYCEMIA

To the Editor:—*The literature available to me indicates that hyperglycemia in the fasting patient may be found in such conditions as hyperpituitarism, hyperadrenalism, and hyperthyroidism. What type of glucose tolerance curve can be expected in such patients? Is there any disease that would cause a normal glucose tolerance curve (over 3½ hours) while the fasting blood sugar level is about 135 mg. per 100 cc. (venous blood)?*

R. J. Kent, M.D., Savannah, N. Y.

Answer.—The fasting hyperglycemia seen so frequently in patients with hyperfunctioning anterior pituitary, thyroid, adrenocortical and adrenomedullary conditions is the physiological opposite of the insulin sensitivity and fasting hypoglycemia accompanying hypofunctioning disorders of those same endocrine systems. As such, it is only a sign of a diabetic syndrome. In greater degree, like idiopathic diabetes mellitus, it also leads to glycosuria and all other manifestations of diabetes mellitus, the major difference being (*a*) the possibility of actual cure (or dramatic improvement) by correction of the hyperfunction and (*b*) marked insensitivity, or even refractoriness, toward the action of insulin. There are no characteristic glucose tolerance curves in this form of the diabetic syndrome. High fasting and peak blood sugar levels and slow rates of return are seen, just as in any patient with ordinary diabetes mellitus. Marked insensitivity toward insulin is much more

characteristic, although not diagnostic. Diagnosis depends upon recognition of the hyperfunctioning endocrinopathy by other criteria. Final proof comes only with permanent disappearance of the diabetic syndrome on correction of the hypersecretion. Most modern textbooks contain adequate discussion regarding these points.

A 3½ hour glucose tolerance curve with a fasting venous blood sugar level of 135 mg. per 100 cc. is not normal. That fasting level is definitely high. If normal postglucose blood sugar levels were seen following such a fasting level, a technical error in the analysis of the fasting blood should be suspected. The same would be true if the high fasting level and normal tolerance curve were obtained on different days. More laboratory data are required to reconcile those discrepant findings.

PSYCHOTIC EPISODE WITH CARDIAC INFARCTION

To the Editor:—*A man, 55 years of age, had an anterior wall infarction. Three days after the shock disappeared and the fever became normal, the patient began to show psychotic manifestations; he tried to get out of bed and run, spoke of visual hallucinations, and cried aloud. His pulse was 96 and was regular except for occasional extrasystoles. The blood pressure was 110/70 mm. Hg. A weak Babinski sign was elicited on both sides. He was given 0.30 gm. of aminophylline, 0.5 mg. of atropine, and 1 gm. of bromide for only one day. How do you explain this psychotic manifestation? Are barbiturates or morphine indicated in such a serious condition? Since this patient used to smoke 100 cigarettes a day, does the abrupt cessation of cigarettes and coffee have anything to do with this condition?*

Sami Akdag, M.D., Samsun, Turkey.

This inquiry was referred to two consultants whose respective replies follow.—Ed.

Answer.—Psychotic symptoms rarely occur in patients with cardiac disease as the result of an infarct of the heart muscle unless there is also an occlusion of a cerebral artery at the same time.This is not infrequently the case when the cardiac and the cerebral disease are both due to atherosclerosis. A cerebral thrombosis is the most likely cause of this patient's agitation and hallucinations three days after the initial heart disease. Barbiturates would not be contraindicated; morphine should be used with caution. The cessation of smoking and coffee are not to be considered primary factors in the development of the psychotic episode.

Answer.—Acute heart muscle infarction due to coronary occlusion is rarely responsible for psychotic manifestations occurring in the wake of an acute cardiac episode. The medicament given to this patient in the dosage stated could not be responsible for the mental symptoms. Both barbiturates and morphine are used freely and generally in the management of acute myocardial infarction. The abrupt discontinuance of excessive use of tobacco and coffee could hardly lead to the severe psychotic symptoms described.

PREVENTION OF MUMPS

To the Editor:—*A 10-year-old boy has had an intra-abdominal rudimentary testicle removed. The other testicle appears normal. Is there a vaccine with which he could be immunized against mumps? Where can it be obtained? Would such an immunization be advisable?*

M.D., Wisconsin.

Answer.—There is a vaccine for the prevention of mumps; however, there is no claim that it confers permanent immunity. Its protective value is usually assumed to endure for from six months to one year. It is well to remember that the mumps virus is grown on chick embryo; therefore that fact may deserve consideration before the vaccine is given to a patient who is allergic to egg. The vaccine is obtainable from both the Lilly and Lederle companies. Ordinarily orchitis as a complication of mumps does not occur before puberty. Consequently there seems to be no indication now for giving the vaccine to the boy in question.

ENCEPHALOGRAPHY IN SKULL FRACTURES

To the Editor:—*I would like an opinion on the routine use of electroencephalography in fracture of the skull when the patient has recovered with no sequelae or abnormal neurological findings. Is anything to be gained by its use in the case of a 9-year-old child that goes to probate court for settlement?*

H. N. Brown, M.D., Chicago.

Answer.—The routine use of the electroencephalograph in fractures of the skull is not indicated. When and if patients who have had skull fractures show definite organic neurological findings and organic aftermaths, then the electroencephalogram may show positive or suggestive tracings of a damaged brain and even the location of the area involved. In the case of a 9-year-old child who has suffered such an injury and has recovered without the least sign of organic brain sequelae, an electroencephalogram would be of doubtful value in arriving at a just settlement. In court even the presence or absence of a skull fracture as shown by the roentgenogram may be disputed by two experts. This may also be true in reading the results of an electroencephalogram.

TRICHOMONAS VAGINALIS

To the Editor:—*The query on Trichomonas vaginalis in* The Journal, *Jan. 23, 1954, page 375, and March 27, 1954, page 1148, was interesting. Rarely have I found T. vaginalis in the urethra or bladder in my private patients during the past 19 years, in over 1,000 cases of T. vaginalis. In the past 10 years, in no case did the bladder have to be irrigated. In eight cases trichomonads were found in the urethra and acted as a focus. These patients were treated by a urologist. In one patient the urologist has been unable to eradicate the urethral (Skene's duct) infestation. The vaginal infestation recurs over and over. In no case have trichomonads been found in the Bartholin glands in private patients. In the Charity Clinic, T. vaginalis organisms in the bladder and/or urethra were usually easily eradicated by catheterizing the bladder and instilling 1 oz. (28.4 gm.) of ⅛ of 1% of silver nitrate. The urethra is massaged through the vagina as the silver nitrate is being instilled into the urethra.*

The real focus has been the male generative organ. In resistant and recurring cases of T. vaginalis infestation the husband should wear a condom at coitus for four to nine months, during which time these trichomonads will usually die out on their own accord. I no longer believe that Trichomonas comes from the rectum or colon, and so I have not treated the gastrointestinal tract in Trichomonas infestation of the vagina in the past 10 years. The foci of importance are the male generative organ, chronic cervicitis, Skene's ducts, and a contaminated bathroom.

Treating the vaginal (trichomonal) infection is much more important than treating the foci in most cases. The foci usually correct themselves if not reinoculated within four months. Chronic cervicitis is coagulated or coned, and the man should use a sheath on the penis at coitus for at least four months. In resistant cases, the vagina is treated during one or two menstruations by blowing the vagina full of powder after the blood is cleaned out. The vaginal epithelium should be kept normal by daily doses of 0.01 mg. of micronized diethylstilbestrol (Stilbestrol) plus a well-balanced diet and a daily intake of B complex and C vitamins and trace elements. Our clinic has shown that B complex and C vitamins and trace elements aid in causing the vaginal epithelium to stay healthy. The insertion of a tablet containing equal parts of lactose, glucose, spreading agents, and four or more trichomonacides and antimonilial agents such as Baculin, which consists of dextrose, anhydrous phenylmercuric acetate, lauryl sulfate, lactose, organic iodine, potassium aluminum sulfate, and papain. The pH value remains at 3.8 to 4 constantly because of buffers. This has been used in over 3,000 cases of Trichomonas vaginalis infestation without a flareup of Candida albicans.

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